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# SECOND REPORT

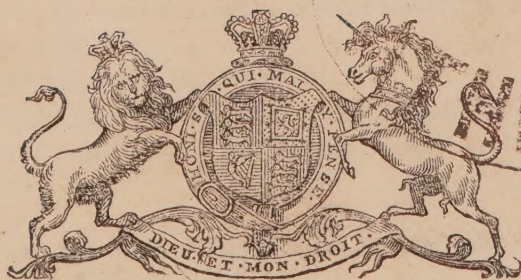
OF

## THE COMMISSIONERS

FOR INQUIRING INTO THE

STATE OF LARGE TOWNS AND POPULOUS  
DISTRICTS.

VOL. I.



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1845.



# SECOND REPORT

## THE COMMISSIONERS

### STATE OF LARGE TOWNS AND BOURGHS DISTRICTS

VOL. I



1861



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## SECOND REPORT

OF

### COMMISSIONERS of INQUIRY *into the* STATE of LARGE TOWNS *and* POPULOUS DISTRICTS.

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TO THE QUEEN'S MOST EXCELLENT MAJESTY.

IN pursuance of the terms of your Majesty's Commission, whereby we are enjoined to report to your Majesty, from time to time, our proceedings, we, the undersigned Commissioners, do now humbly present this our further report.

We stated in our First Report the course which we considered it our duty to pursue in prosecution of our inquiry, to which we appended the evidence we had then received, and also an abstract of the replies then given from fifty towns visited, showing their condition in respect to drainage, cleansing, and the supply of water.

We now add in an Appendix the reports made by the several Commissioners. We refer to them, as showing the existence of evils varying slightly in character, and prevailing with different degrees of intensity in the several towns visited, but generally pressing with most severity on the poorer classes. We believe they may be taken as correct indications of the prevailing condition of other towns and populous districts in this part of the United Kingdom. In this report we shall endeavour to point out those evils which, we are of opinion, might be removed by greater vigilance and activity on the part of the existing authorities, and to bring under consideration such as require further legislative provisions for their prevention.

It appears from the replies above alluded to, that there are only eight of the fifty towns visited in which even a tolerably favourable report could be given in respect to drainage and cleansing; and as regards the supply of water, the returns, especially in the districts inhabited by the poorer classes, are still more unfavourable.

The general prevalence of the evils demonstrated affords General neglect

*Causes of  
Disease.*

of preventive and  
corrective reme-  
dies.

direct evidence of an equal neglect of the preventive and corrective remedies, and of the absence of the requisite regulations for ensuring the adoption of such measures as have been enacted.

Until the publication of the reports made to the Poor Law Commissioners in 1839, upon the condition of the poorer classes of your Majesty's subjects in certain parts of the Metropolis, followed by the report of a Select Committee of the House of Commons in the year 1840, "on the Health of Large Towns and Populous Districts," the extensive injury to the public health, now proved to arise from causes capable of removal, appears to have escaped general observation, while the means of remedying the evils by improvements in drainage, or by other structural arrangements, as have been carried into operation, have been executed more with a view to the appearance of the town, or the comfort of a portion of its inhabitants, than directed to maintain the health of the whole community.

We have much satisfaction in stating that subsequent investigations and reports have excited increased attention to the importance of providing for the physical condition of the poorer inhabitants of large towns. The wealthy and intelligent classes resident in them are now for the most part becoming alive to this great question, and to the necessity of providing for the removal of those causes, which tend to vitiate the air in the quarters occupied by the poor, and especially in those most densely crowded. We trust that, assisted by the information which the advance of science and general intelligence places at their command, and directed by the views and suggestions published from time to time in reports laid before Parliament, by your Majesty's direction, the local authorities will carry into operation with efficiency, under such guidance as we shall presently consider it our duty to recommend, the laws that may be intrusted to their execution.

Advantage of the  
mode of inquiry  
adopted.

We have reason to believe that the course of inquiry adopted by us for obtaining information respecting the condition of the several towns visited, by calling to our aid the assistance of the most influential and intelligent of the inhabitants, through whose means and local knowledge the peculiar conditions of many localities were closely investigated, has exposed to their view scenes of misery and neglect, of which many were previously ignorant, and directed their attention to causes of disease, arising from the defective state or absence, of proper structural arrangements.



*Causes of  
Disease.*

Economy in the  
construction of  
works essential.

We have found it necessary to investigate many details, involving questions of economy and efficiency in the execution of works; there is much evidence to show that the practicability of improvement is mainly dependent on the economy of construction, and on the mode of levying the charges, and distributing the repayment of the cost over a series of years. We have brought forward these details in the evidence already laid before your Majesty; and in the course of this report we shall further point out such as we consider best adapted to effect the objects desired.

Although we have deemed it necessary, in carrying out to the fullest extent the object of your Majesty's Commission, to institute particular inquiry into the condition of several of the largest towns, we were careful to make it understood that our investigations were not made for the purpose of recommending any specific plan for the improvement of the drainage, or for removing the other defects in the several districts so visited, but that the object of the inquiry was principally directed to the collection of data, sufficient to enable us to suggest recommendations upon which an efficient general measure to ameliorate the prevalent evils might be founded.

We stated in the First Report that we had selected the several towns for examination with reference to the rates of mortality, as shown "by the returns of the registers of death, with a few exceptions, to be the highest." The character of the information, contained in the Appendices to our Reports, strongly exhibits the advantages to be derived from registration, as far as the present system enables us to ascertain the true causes of disease and death, the proportion of deaths to the population, or the occupation of those who died.

Registers of  
deaths generally  
the best guide in  
such inquiries.

The statements of excessive mortality, derived from an examination of the books of the registrars of the towns visited by us, in every instance produced a laudable zeal on the part of the inhabitants of those towns to aid our inquiries as to the causes of disease in those places, and their local knowledge enabled them materially to facilitate our investigations.

As the subjects specified in your Majesty's Commission are essentially of a practical character, we have endeavoured to avoid as far as possible the discussion of the theoretical causes of disease. All the medical witnesses examined before us are unanimous as to the injurious effects produced by emanations from animal or vegetable matter in a state of decay, whether they act as direct or contingent causes of disease; and they are quite concurrent in their opinion that the existence of such causes and their prevalence have been sufficiently ascertained to require the interference of the

*Causes of Disease.*

Legislature.\* The presence of such emanations, whether they be derived from stagnant ditches, from open cesspools, or from accumulations of decaying refuse, is a great cause of disease and death, not confined to the immediate district in which they occur, but extending their influence to neighbouring, and even to distant places.†

These physical causes of disease may affect various localities and different classes of persons, but are most common and virulent in the neglected districts and dwellings of the poor, who are peculiarly exposed to the aggravating influences of such causes,—not necessarily connected with their condition in life, but capable of being removed by efficient drainage, cleansing, improvements of buildings, ventilation, and a sufficient supply of good water.

Influence of poverty in the production of disease.

It is too commonly supposed that the evils above adverted to are the inseparable concomitants of poverty; and, doubtless, so long as the inhabitants of the most neglected and filthy abodes in crowded cities are unable to provide for themselves better and healthier dwellings, sufficient light and air, more open situations, effective cleansing and drainage, and adequate supplies of water, their vigour and health are undermined, and their lives shortened by the deleterious external influences consequent upon the want of efficient arrangements for securing the above objects. The operation of general sanitary arrangements will enable a greater number to contribute a share to such arrangements by which they must largely benefit, and thereby, and at a comparatively small cost to the community at large, to have the advantage of the remedial improvements above specified.

Without entering into any discussion upon the influence which poverty and distress may occasion on the rates of mortality, which no sanitary improvements can entirely prevent, we are desirous to remove the injurious impression that a great amount of excessive disease and death in this country is due to causes which cannot in a considerable degree be removed by legislative enactments when earnestly enforced. At the same time we must express our opinion that the efficient execution of the law will tend to reduce sickness and disease, and so far increase the means of the poor.

Other diseases besides fever, resulting from injurious emanations.

Medical witnesses of much experience state that the continued action of injurious emanations, though they may not always produce fever, often become the cause of some of the most common and fatal maladies of this country,‡ and the

\* Evidence of Dr. S. Smith, First Report, vol. i. p. 1.

† Ibid., vol. i. p. 17.

‡ Ibid., vol. i. p. 8.



residence more or less prolonged in a vitiated atmosphere is a great cause of the scrofulous diseases, extensively prevalent in the large towns.\*

*Causes of Disease.*

In an inquiry into the influence of employments on health, it appears that the relative excess of deaths from consumption among tradesmen and artisans, compared with other classes, is mainly to be attributed to the vitiated state of the atmosphere in their shops and dwellings. The average age at death from consumption has been found to be lower in the case of tradesmen than among artisans; this is stated to be owing to a larger proportion of the latter being employed in out-door work, and therefore less continually exposed to the influence of an impure air.†

In addition to the evils arising from the absence of ventilation in the interior of dwellings, a great amount of disease is engendered by the polluted condition of the atmosphere in the close and confined courts in which a large proportion of the poor constantly dwell.

Our attention has been called to the consideration of the ages at which the physical causes of disease produce their most marked effect; and while the returns show that these effects are peculiarly severe on infantile life,‡ yet they are not confined to any particular age, acting powerfully on persons in the full vigour of life as well as on the younger part of the population. These returns all show that the extreme pressure of the physical causes of disease is upon the working population, shortening the average duration of life from 1 to 20, and even to 30 years, and decreasing to a material extent the working ability of the survivors. We find, however, at the same time, that the duration of life of the middle and higher classes is materially lessened by the pressure of these removeable causes of disease. In the diseases which follow, in a more marked degree, from the direct or indirect influ-

Extent of disease and mortality among infants.

\* Evidence of Mr. Toynbee, First Report, vol. i. p. 74.

Sir James Clark regards "the respiration of a deteriorated atmosphere as one of the most powerful causes of tuberculous cachexia. There can be no doubt," he adds, "that the habitual respiration of rooms of ill-ventilated and gloomy alleys in large towns is a powerful means of augmenting the hereditary disposition to scrofula, and even of inducing such a disposition de novo."

Mr. Allison, after alluding to the fact that a large proportion of the great early mortality in large towns is due to scrofulous disease, remarks, "that deficiency of fresh air and of exercise are among the most powerful and the most important, because often the most remediable of the causes from which scrofulous diathesis arises."—Cited in the Report by Dr. Duncan, First Report, vol. i. p. 137.

† Evidence of Dr. Guy, First Report, vol. i. p. 93. Dr. Guy's estimate of the number of deaths from consumption.

‡ First Report, Preston, vol. i. p. 174; Nottingham, vol. i. p. 336.

*Causes of Disease.*  
—

ence of injurious emanations, especially in the case of fevers of the typhoid type, by far the greater proportion of cases occur amongst the heads of families between the ages of 20 and 30, the very period when they have generally the greatest number of young children dependent on them for support.\* The effect of the physical causes of disease is not confined to any class or age.

Decrease in the mortality in improved districts.

The inquiries into the state of districts before and after improvement have distinctly shown, that increased facilities for the removal of refuse in and about the habitations of the poor have been rapidly followed by a marked improvement in the health, and by a reduction in the rate of mortality of the district. An instance of this kind was observed in Manchester by ascertaining the amount of deaths in 20 streets before and after their improvement, by which it was ascertained that the deaths immediately subsequent to the drainage and paving of the streets were diminished more than 20 per annum out of every 110.† This mode of exhibiting the immediate effects of structural improvement has been confirmed in other instances,‡ and is cited in verification of the same results, obtained by estimating the mortality in improved and in unimproved districts of a like population.

Charges upon the community from excessive disease.

The loss of life which occurs annually from a neglect of the measures necessary for rendering wholesome the dwellings of the poor and the streets adjacent, must be accompanied by serious pecuniary charges both upon the sufferers themselves and upon the community. The prolonged attacks of sickness which precede this excessive mortality, render the victims of it incapable of following their daily occupations, and reduce them and their families to the necessity of seeking relief from the parish and other funds, which are eventually burthened with the maintenance of the surviving members of the family.

The pecuniary saving from this and other sources which has been pointed out as the inevitable result of a large outlay for improvements, has been urged upon us as an argument to justify the interference of the Legislature; and to show the enormous pecuniary loss incident on the present state of things, we refer to the Table given in the Report on Lancashire.§ But we are unwilling to rest our case upon this foundation. The much higher and more important benefits to the health and morals of the community, which must

\* Evidence of Dr. S. Smith, First Report, vol. i. p. 6.

† Mr. Holland on Chorlton, First Report, vol. i. p. 204.

‡ Returns from Leicester, First Report, vol. i. p. 269.

§ Report on Large Towns in Lancashire, Second Report, vol. i.



equally result from such improvements, still more imperatively call for earnest endeavours to promote their adoption.

We have found the opinion to be very prevalent, that excessive mortality, acting principally on the infantile part of the community, is a natural check to the increase of population, and that the scourges of disease and pestilence are consequent upon a disproportionate increase of births.

Although the facts within our reach have not enabled us to come to any precise conclusion in refutation of this opinion, we are anxious to draw especial attention to the returns of the registrars of deaths, which elucidate this important question. They clearly show that an excess of deaths, with but few exceptions, is accompanied by an excess of births. In the manufacturing districts, in which peculiar causes operate in the production of an excessive mortality, an excessive proportion of births is also observed ;\* and an unhealthy and feeble population is thus retained, to be still more liable to be affected by the extensive causes of mortality.

But though excessive disease and death in an unhealthy community do not check the increase of population as might have been anticipated, they act very powerfully in depressing the physical condition and working ability of the survivors, in many cases rendering them premature burthens on public or private charities.

This is shown by the large amount of widowhood and orphanage, and by the number of persons in densely populated places, supported by the poor-rates and by charities, who are superannuated at ages which are considered fit for

Causes of Disease.

Influence of excessive mortality on the increase of population.

\* Report upon York, First Report, p. 235, Table 8 ; Preston, *ibid.* p. 200 ; Nottingham, *ibid.* p. 339, Table 3 ; Fifth Report of the Registrar-general, p. 234.

The rate of increase of births, in proportion to the deaths may, perhaps, be distinctly seen if we take the two extreme counties in respect to infantile mortality—Westmoreland, where it is the least—Lancashire, where it is the highest :—

	Annual Proportion per Cent. of Deaths of Children under 1 Year of Age to Total Births.	Proportion of Annual Deaths to each 10,000 of the Population.	Annual Proportion of Births to each 10,000 of the Population.	Assumed Natural Increase of the Population, from Births, per Cent., from 1831 to 1841.	Annual Proportion of Marriages to each 10,000 of the Population.	Proportion of Young Children alive under five Years of Age to each 10,000 of the Population.	Proportion of Persons alive above 50 Years of Age to each 10,000 of the Population.	Average Age of all who die.
Westmoreland.	9.2	206.9	285.6	7.9	60.3	1255	1629	Y. M. 38 0
Lancashire.	17.7	279.2	370.5	9.1	89.3	1382	1068	22 10

See Table in the Supplement to this Report, p. 185.

*Causes of  
Disease.*

labour in a population possessing an average degree of health.

A large class of crimes, arising from intemperance and the indulgence of vicious propensities, is much fostered by the low state of physical comforts, which leads to the use of stimulating drinks and to other methods of imparting false strength to a reduced system. These act with the greatest intensity on the inhabitants of those places, where filth and the absence of facilities for its removal depress the energies, and engender disease and death.

*General deficiency in the supplies of water.*

In addition to other causes of disease generally prevalent among the poorer classes of large towns, the almost universal scarcity of supplies of water for domestic use has been urged upon our attention as contributing in a very great degree to increase the evils under which they labour. It is difficult to estimate with any accuracy the influence produced on the health of the poor from this serious defect ; but all those evils which have their origin in want of cleanliness must be greatly aggravated by this cause. The great moral results consequent upon an increase in the means of cleanliness have not yet, we fear, received the attention which their importance merits ; the domestic comfort of a poor man's abode, and his own self-respect, are mainly dependent upon this. We are convinced that their neglected condition is by no means the result of choice, although it may be the result of habit, produced by an unfortunate necessity. We shall have occasion, in a subsequent part of the report, to cite proofs of the ready appreciation by the poor of this great benefit, and of the improvement among them consequent upon the introduction of a better supply of water.

It is not only for the more common description of household cleanliness that a better supply of water is required ; its scarcity has hitherto prevented its use for many purposes, to which it can be most conveniently and economically applied.

In houses of the wealthier classes, water has long been introduced for the removal of the most offensive description of refuse ; and we have no doubt that as the means are gradually afforded, the opportunity of relieving the scavengers of this duty will be gladly embraced. We shall subsequently show that it is the cheapest, and we may add, the most efficient method.

*The practice of  
administering  
opiates to infants.*

Our attention has been particularly directed to the prevalence of a very injurious practice of administering opiates to young children, calculated to increase the effect of physical causes of disease already pressing with great severity on the



infantile part of the population. The habit thus introduced has become to an alarming degree prevalent, especially in the manufacturing counties, although it also occurs to a considerable extent in rural districts, and is not confined to infants suffering from disease, but is also extended to those in a state of health, in order to ensure their more easy management, when the mothers are absent from home. The administration of these drugs is not confined to unlicensed practitioners alone, it is but too generally adopted by the parents themselves, and by those persons under whose care infants are left during the hours when the mothers are engaged in their daily avocations. To the Report on the Large Towns in Lancashire, there is appended the evidence of druggists on this point, showing clearly that the effects produced by the habitual use of such stimulants, are well known, both to the vendors and to the parents who administer them to their children. Physicians and surgeons in extensive practice in the manufacturing districts, give it as their decided opinion that this terrible practice is productive of much disease and death, and that the constitutions of those who survive the effects of the narcotics are, in many cases, ruined, and that the mental capabilities of such persons are materially impaired. As soon as the physical causes producing irritation and constitutional disturbance, or disease, are removed, one of the great inducements to the use of these opiates will be diminished, and the moral evils lessened which now tend to the extension of the practice. Although an inquiry into this subject may not be considered to be strictly within the terms of our Commission, we feel that we should be remiss in our duty if we did not draw particular attention to the facts\* that have been laid before us, proving the existence of this very serious evil.

The considerations which we have adduced show that the absence of sanatory regulations in the various cities and towns in this kingdom, render it necessary that measures more decided and effectual than those now in force should be adopted to improve and preserve the health of your Majesty's subjects.

A laudable desire to effect the improvements in structural arrangements necessary to produce this end, has been shown in local Acts which have been passed for this purpose. These Acts appear, however, to have been framed without due know-

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\* Report on Preston, First Report, vol. i. p. 183; Report on Ashton-under-Lyne, First Report, vol. i. p. 300; Report on Large Towns in Lancashire, Second Report, vol. i.

*Causes of  
Disease.*

ledge of the evils existing, or of the means necessary for their removal, and they are in general extremely defective, and in many instances are even inadequate to effect the purposes contemplated in their provisions.

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*Remedial measures.*

Having stated the causes to which our investigations into the condition of the inhabitants of Large Towns and Populous Districts have led us to ascribe much of the prevalent disease and mortality, we proceed, in obedience to the instructions contained in your Majesty's Commission, to offer recommendations for the amendment of the laws at present in force relating to the sanatory condition of your Majesty's subjects.

This part of our duty has been one of great difficulty, and has imposed great responsibility. Duly sensible of this, we have exercised the greatest caution and the most anxious attention which the magnitude of the subject, the importance of the provisions, and the intricacy of some of the details have demanded from us.

Before we could arrive at any satisfactory conclusion as to the amendment requisite in the existing laws relating to the public health, we found it necessary to institute an examination into the general provisions of the numerous local Acts now in operation. The absence of any general law containing such provisions as are essentially necessary for the maintenance of the public health in large towns and populous districts, and the want of uniformity in the legal principles generally embodied in local Acts, has greatly extended this branch of our inquiry. The local Acts having generally been obtained at the instance of persons who possessed, in common with others, but limited information on the subject besides their legal defects, do not contain those provisions for the execution and adaptation of different works, which this and former inquiries have shown to be essential for the successful application and combination of sanatory improvements.

The connexion of the house and main-drains, and the dependence on a good supply of water for their efficient action, appear to be necessary parts of an efficient measure, and involve, with many details, an inquiry into the general system of supplying water, and of combining it with the other duties usually intrusted to Commissioners under local Acts.

We have given due weight to the consideration that it must be a work of time to complete the extensive amelioration of the population of large towns, which the neglect of former



years requires. Continued attention to this subject will rapidly induce further improvements in the structural arrangement of dwellings.

We now lay before your Majesty a short outline of the measures which appear to us to be necessary for this purpose ; and then proceed more in detail to state our reasons and such observations as occur to us on each branch of the subject.

Summary of measures recommended.

We are of opinion that, for the effectual correction of the evils above adverted to, additional legislative measures are requisite.

It is necessary that the Crown should have power to inspect and supervise the execution of all general measures for the sanitary regulations of large towns and populous districts.

That the local authorities intrusted with the execution of such measures should be armed with additional powers, and that the districts placed under their jurisdiction should in many cases be enlarged, and made co-extensive with the natural areas for drainage.

We recommend that the necessary arrangement for drainage, paving, cleansing, and an ample supply of water (the most important matters conducive to health), should be placed under one administrative body.

We also urge the necessity of some general sanitary regulations relative to buildings and the width of streets, and that low lodging-houses should be placed under public inspection and control.

The mode in which we propose to carry out these objects is detailed in the recommendations which are subsequently stated in this report, with the reasons which have induced us to adopt them.

We have arranged the different branches of the subject in the following order :—

General division of the subject.

1. Drainage, including house and main-drainage, and the drainage of any space not covered with houses, yet influencing the health of the inhabitants.
2. The paving of public streets, and courts and alleys.
3. Cleansing; comprising the removal of all refuse matter not carried off by drainage, and the removal of nuisances.
4. A supply of water for public purposes and private use.
5. The construction and ventilation of buildings for promoting and securing the health of the inhabitants.

1.  
Drainage.  
General deficiency.

I. Among the evils which appear to operate with the greatest severity on the condition of all, and especially of the labouring classes, are those arising from the absence of a proper attention to drainage. They prevail almost universally, to an extent altogether incompatible with the maintenance of the public health; and even in those places where recent improvements have been effected, a desirable standard is far from having been attained, either in respect to the perfection of the necessary arrangements for drainage or of economy in executing the works.

The want of efficient means for the immediate removal of all refuse and excessive moisture is not only felt with regard to a large proportion of houses, but also prevails extensively in the streets and other public thoroughfares in towns, while the densest portions, which contain the poorest of the population, are in general altogether unprovided with underground drainage, particularly those parts which consist of courts and alleys, and other spaces not intersected by any leading thoroughfare.

The substance of the replies on this subject contained in the Appendix to our First Report,\* showing the extent to which the towns visited are in want of legislative provisions for drainage, or in which such provisions are defective or inefficiently carried into execution, is equally applicable to other towns and populous districts.

State of the general laws relating to Drainage.

In our investigations into the laws relating to drainage, we find that, under the existing laws of sewers, the Crown is invested with authority to determine the areas of jurisdictions for drainage, as well as to constitute the authorities who shall have power to act for the public protection within them. That no previous surveys or other means have hitherto been provided for the proper definition of drainage boundaries previously to the grant of local authority, by Commissions or under local Acts, may perhaps be accounted for from the attention of the Legislature not having been hitherto sufficiently directed to that part of the subject; and that, in the case of the earlier exercise of the authority of the Crown, the first applications for its intervention having been made probably with a view to the removal of surface waters of an extent visible to the eye, or the prevention of excessive floods.

Early proceedings for issuing Commissions of inquiry and survey preparatory to the execution of measures of Drainage.

It is, however, apparent on a review of the course of legislation on this subject, that most serious attention was given to works of drainage from the earliest periods of our consti-

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\* First Report, vol. i. p. xxxii.



tutional history. The earliest fundamental provisions have been based upon the footing that such works, as well as measures for the maintenance of the free flow of running waters, were of general public and national, rather than of exclusively local, consideration. It is held, by the first legal authorities, to be one of the prerogatives of the Crown to issue commissions for the protection of the population, by the enforcement of proper works of drainage, and this prerogative appears to have been exercised by the issue of special commissions, as well after as before the passing of statutory provisions on the subject. The intervention of the Crown was often urgently sought for the public protection against the injurious encroachments of private interests upon the great public watercourses for mill power or for fishing-weirs. The XVIth chapter of Magna Charta is a defence of the public rights against the growth of such encroachments. The fourth statute of the 25 Edw. III. c. 4, provides for the putting down of mills, weirs, dams, and other obstructions, and commissions appear to have been issued from time to time to see to the execution of the laws provided thereon.

*Drainage.*  
Commissions of  
Sewers.

The laws and customs of Romney Marsh appear to have been established at a very early period, as the principles upon which all proceedings under these Commissions should be conducted. In these laws it is recited, that they were settled by a learned judge, Henry of Bathe, under a special commission from the Crown, in the reign of Henry III.

“By counsel of our Lord the King, it was provided, that there might be sent the justices of our Lord the King, to ordaine and depose that which should be meete to appease those strifes;” “so that Henry de Bathe was sent thither, and all the tenants of the said Marsh had summons of forty days,” &c. &c.; “the said Henry having *seene* the walls and watercourses aforesaid,” &c. “and the said Henry going *in person* to these parts ordained, &c.” The tenor of other commissions, runs—“*Assignavimus vos ad supervidendum wallias et fossata, etc., et ad inquirendum per quorum defecta hujus damnum contigit ibidem.*”

In illustration of the earlier commissions issued under the Crown, which were not confined to works of drainage only, or to a judicial intervention, but were extended to the formation of new roads, and the maintenance of old ones,\* and other

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\* E. g.: Patent 51 Edw. III. m. 41. “Edwardus Dei gratia Rex Angliæ et Franciæ et dominus Hiberniæ, dilectis sibi Johanni Herlyngton, Radulpho Gamel, Willielmo Pechel, Waltero Pigge, Hugoni Feukson et Willielmo...de Yakesle salutem. Sciatis quod concessimus vobis in

*Drainage.*  
Commissions of  
Sewers.

public works, we have found a commission of the third year of Henry IV. for providing the means of conveying pure water to the inhabitants of Kingston-upon-Hull,\* as well as for draining that town, and removing impure sea or marsh water. The commission recites, "that there appears to be need in those days of great charges and expenses for the protection of the same town against the force of the water aforesaid; and so, as well on account of charges and expenses of this kind there daily arising, to be sustained and supported, as that sweet water is not had, coming and flowing to that town, except only by boats, and at that sumptuous cost; whereby the poor inhabitants of the town aforesaid, in large numbers every year, during the summer time, of necessity, on account of the scarcity and dearness of water of this kind, depart from the same town, and renounce and avoid it, to the injury of the town aforesaid, and in process of time to the final destruction of the same, unless a suitable and speedy remedy in this matter be speedily applied," &c. The Commissioners' return specifies the particular works needed for the relief of the

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auxilium dictæ villæ et viarum eidem adjacentium paviandæ, quod a die confectionis præsentium usque ad finem trium annorum proximo sequentium plenarie completorum capiatis in dicta villa consuetudines subscriptas, videlicet, &c. Et ideo vobis mandamus quod prædictas consuetudines usque ad finem termini prædicti capiatis sicut prædictum est, completo autem termino dictorum trium annorum dictæ consuetudines penitus cassentur et deleantur."—Inquisition ad quod damnum, 12 Edw. II. Writ to inquire whether the causeway and bridges in the way called Longfore, between Blecheleye and Newport, in the county of Salop, are so broken as to be dangerous, and if any certain persons are bound to repair them, and if they be not, whether it will be to the prejudice of the king or others, if he grant a frontage for the repair.—Patent Roll, 10 Edw. III., p. 1. Appointment of commissioners to survey the state of the walls, ditches, sewers, bridges, &c. on the sea coast in Liveryngham, Nenton, and Wysebech in co. Camb. (except the field called Rummere), and to inquire by whose default they have become ruinous, and to distrain persons holding lands, tenements, fisheries, &c., there to repair them.—Inq. ad quod. dam., 34 Edw. III. Writ to Henry Peverell, custos of Southampton, ordering him to inquire concerning defects, &c. in the walls of the town, and concerning porches and gardens made on the walls.—All gorges, mills, weirs, stanks, stakes, and kiddels set up in great rivers, in the time of Edward I., and after, shall be pulled down, and sheriff shall do execution. (25 Edw. III.)—Agnes de Dunlegh prays the king to cause certain walls to be repaired, to restrain the overflow of the Thames, which he was bound to do in virtue of a purchase made by him of messuages, &c. in a place called La Rofere contre La Tour, in Southwark, (4 Edw. III.)—Petition for constraining the mayor, &c. of Cambridge, to cause the town ditch, &c. to be cleansed, (52 Hen. III.)—A confirmation of the statutes of levying and straitening weirs, mills, stanks, stakes, kiddels, &c. (1 Hen. V.)—A general commission of sewers proposed and enacted. (2 Hen. VI.)—Dismes, &c. respite for two years to the inhabitants of Malberthorpe, co. Linc., on account of their charges to defend themselves from being inundated by the sea. (9 Hen. VI.)—Abbess of Denys, and the master of the hospital of Strode, prayed to answer for neglecting to embank their land near Rochester Bridge. (11 and 12 Hen. VI.)—From *Collections of Records and Precedents*, by T. Duffus Hardy, Esq.

\* Report on Hull, Second Report, vol. ii.



town, by proper supplies of fresh water, and the removal of the marsh water, for the execution of which works so recommended after this local examination and report, due sanction is required.

*Drainage.*

Commissions of Sewers.

The practice of issuing commissions for previous local inquiry and survey appears to have been discontinued, on the passing of an Act in the 6th year of the reign of Henry VI. to regulate the issue of commissions. The provisions of this statute were subsequently embodied in an Act passed in the 23rd year of the reign of Henry VIII.; this statute, with some minor modifications by the stat. 3 & 4 Wm. IV. c. 22, is still the chief subsisting law in force. Previously to the statute of Henry VIII., the Commissioners of Sewers were named direct by the Crown. By this statute, it was provided that they should be named by the Lord Chancellor, the two Chief Justices, and the Lord Treasurer. The Commissioners so named are to sit as a Court of Record, and in the execution of their duty they may proceed by jury, or upon their own view, and may take order for removal of any annoyances or nuisances, or for the safeguard and conservation of sewers, within their area of jurisdiction, as set forth in the Commission, at their discretion, according to the laws and customs of Romney Marsh as above recited. This statute, (under which a large portion of the Metropolis, and many rural districts—we believe, about 80 in number, comprising large tracts of country, are now drained,) recites “the great damages and losses which have happened by the influx of waters upon marsh grounds and other low places, heretofore through politic wisdom won and made profitable, for the great commonwealth of this realm, as also by occasion of land, waters, and other outrageous springs, in and upon meadows, pastures, and other low grounds adjoining to rivers, floods, and other watercourses; and over that, by and through mills, mill-drains, weirs, fish-garths, kedels, gores, gotes, floodgates, locks, and other impediments in and upon the same rivers and other watercourses, to the inestimable damages of the commonwealth of this realm, which daily is likely more and more to increase, unless speedy redress and remedy be in this behalf shortly provided.”

Statute 23 Hen. VIII. c. 5.

Sec. 1.

Statute 23 Hen. VIII., c. 5. s. 2.

It enacts, “that Commissioners of Sewers and other the premises shall be directed in all parts within this realm from time to time—

Qualification of Commissioners of Sewers.

“Where and when need shall require, to such substantial and indifferent, *i. e.* impartial, persons as shall be named by the Lord Chancellor and Lord Treasurer of England, and the

Sec. 10.

*Drainage.*

Statute 23 Hen.  
VIII.

two Chief Justices for the time being, or by three of them, whereof the Lord Chancellor to be one.

In respect to the qualification of the Commissioners, it provides that no person shall be allowed to sit—

“ Not having lands and tenements, or other hereditaments, in fee-simple, fee-tail, or for term of life, to the clear yearly value of forty marks, above all charges, to his own use, except he be—

“ Resident, and free of any city, borough, or town corporate, and have moveable substance of the clear value of one hundred pounds ; or else—

“ Be learned in the laws of this realm in and concerning the same, that is to say, admitted in one of the four principal inns of court for an utter barrister.”

The Crown may confer on them powers of making “ laws, acts, decrees, and ordinances ;” these “ laws, ordinances, and decrees to be made and ordained by the said Commissioners, or any six of them, by the authority of the said commission, shall bind as well the lands, tenements, and hereditaments of the King our Sovereign Lord, as all and every other person and persons, and their heirs for such their interest, as they shall fortune to have or may have in any lands, tenements, or hereditaments, or other casual profit or advantage, or commodity whatsoever they be,” &c.

They are specially directed in their instructions to proceed as follows :—

Powers to execute  
works.

“ By such ways and means, and in such manner and form as to you, or six of you, whereof the said A, B, and C, to be three, shall seem most convenient to be ordained and done for redress and reformation to be had in the premises ; and also to reform, repair, and amend the said walls, ditches, banks, gutters, sewers, gotes, calcies, bridges, streams, and other the premises, in all places needful ; and the same as often, and where need shall be, to make new, and to cleanse, and purge the trenches, sewers and ditches, in all places necessary ; and further to reform, amend, prostrate, and overthrow all such mills, streams, ponds, locks, fishgarths, hebbing-weirs, and other impediments, and annoyances aforesaid, as shall be found, by inquisition or by your surveying and discretions, to be excessive or hurtful ; and also to depute and assign, diligent, faithful, and true keepers, bailiffs, surveyors, collectors, expeditors, and other ministers and officers, for the safety, conservation, separation, reformation and making of the premises.”

Sec. 8 and 9.

Under the terms of the existing statutory provisions in



respect to the levy of charges, they are armed with most extensive powers.

If any person assessed, or taxed to any lot or charge, upon any lands, tenements or hereditaments, or copyhold, or customary lands, within the limits of any Commission of Sewers, do not pay the said lot or charge, according to the ordinance and assignment of the said Commissioners, and if, by reason thereof, it happen the Commissioners lack payment of such lot and charge, the Commissioners may, for the purpose of obtaining payment of such lot or charge, decree and ordain the same lands, tenements, and hereditaments, and copyhold or customary lands, from the owner or owners thereof, and their heirs respectively, to any person or persons for term of years, term of life in fee simple, or in tail; or in case of such copyhold or customary lands, for such estate and interest therein as the owners thereof, or any claiming in remainder under them, had in such copyhold or customary lands at the time of the decree being made, such decree and ordinance shall bind every person, who, at the time of the making of such decree had any interest in such lands, tenements, and hereditaments, or copyhold, or customary lands, in use, possession, reversion, or remainder, their heirs and feoffees, and every of them. The statute provides that the Commissioners may otherwise punish the debtors and detainers of any collection, tax, or assess, by fines, amerciaments, pains or other like means, after the good discretions of the Commissioners.

It is further provided, that the Crown may at its pleasure, by writ of *supersedeas*, at any time discharge "as well every such Commission as every Commissioner that shall be made or named by authority of this Act; after which discharge the said Commissioner shall have no power or authority to proceed in the execution of the Commission, nor in anything by authority of this Act."

The prominent defect of the Statute of Sewers appears to be the departure from some of the earlier precedents of a previous local examination, survey, and plan of works by responsible officers, previous to the grant of authority for their execution; and the omission of practicable securities to owners or occupiers, or of an available appeal against the Commissioners' negligence, inefficiency, or waste, in respect to the works executed. The supervision and control of the superior courts of law has chiefly been directed to remedy defects in the technical procedure under Commissions. Had the principle of the previous determination of works, as well

*Drainage.*

Statute 23 Hen. VIII.

Powers to levy rates.

*Drainage.*  
General Laws.

as of boundary, by a local examination, been carried out by any competent agency as a preliminary to the grant of any local Act, it is scarcely possible that such extensive evils as are described in the evidence we have received could have arisen.\* We have not found one provincial town in which any Commissions are now in force. But in the metropolis it has been necessary, in the majority of cases, to have in addition a special local Act to meet local contingencies.

General Turn-  
pike Act, 3 Geo.  
IV. c. 126.  
General Highway  
Act, 5 and 6 Wm.  
IV. c. 50.

The other general laws, which contain any provisions capable of application to the drainage of towns, are the General Turnpike and General Highway Acts. Clause 115 of the former Act contemplates the use of road drains for the drainage of the adjacent houses, and empowers justices, on the application of the trustees of any turnpike roads, to apportion the expense of their maintenance between the turnpike trust and the inhabitants using the drains. But this provision does not appear to have been adopted in any populous town or district, its operation being necessarily limited to those parts under the superintendence of turnpike trustees—usually the principal streets only: the drainage of the bye-streets and lanes is executed under the powers of the Highway Act. This Act is in force in many places of considerable population, and generally affords the only means for the drainage of the suburbs of the largest towns. It will therefore be necessary to state shortly the provisions contained in it, and to point out their inadequacy for the purposes of drainage, for which the provisions of this Act are frequently applied.

Sec. 6.

The powers and authorities for the execution of it are intrusted to the parish vestry. By the sixth section, the vestry is required to elect annually one or more persons as surveyors, who must be qualified by estate, and are liable to a penalty of 20*l.* if they refuse to serve the office, unless they provide a sufficient substitute. The vestry are also empowered to appoint annually a surveyor, with a salary: he is required to be a person of skill and experience.

Sec. 9.

Sec. 18.

In parishes containing a population of 5000 persons, the vestry are authorized to elect annually not less than five, or more than 20 householders to serve the office of surveyors, to form a Board for the repair of the highways, in whom all the powers granted to the vestry are transferred. They also have authority to appoint and pay an assistant-surveyor of

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\* See p. 130, regarding the mode of arranging the boundaries of the Holborn and Finsbury districts in London.



“ skill and experience,” and other officers, and are required to present their accounts to the vestry annually.

*Drainage.*

Highway Act.

Sec. 13.

The Act also contains a power for the union of parishes into districts, and the appointment of a district surveyor under the authority of the magistrates of the division ; but although the adoption of this power would afford the opportunity of obtaining the services of a better class of officers, by remunerating them at salaries worthy the acceptance of skilled and experienced men, we do not find that such districts have anywhere been formed.

The 67th section relates to drainage, and empowers the surveyor to make and cleanse the necessary ditches, gutters, drains, and water-courses, and carry them into and through the adjoining lands, upon paying compensation to the owner. The next clause forbids the owners of the land from altering or obstructing such drains.

Sec. 67.

Although the powers for drainage contained in this Act were evidently intended only to provide the means of carrying off the surface-water from the streets and roads, yet the drains made under its provisions are frequently used for, and afford the only means of conveying away the refuse from the houses in many large towns, and still more frequently in suburban districts. The use of these drains for a purpose for which they were not originally intended, and are not constructed, is the cause of serious annoyance, felt in all parts of the town through which they pass.

Defective powers for drainage of towns.

Other of the provisions are defective, from the absence of a power to compel the surveyors to perform their duty. Under the provisions of a former Act now repealed, the surveyors of the highways had power to require and compel the occupiers of the land adjoining to scour and cleanse the main sewers and drains, or to pay the expense of it. The General Highway Act now in force contains no such provision ; it only empowers surveyors to scour, cleanse, and keep open all ditches, gutters, drains, or water-courses, adjoining or lying near to any highways, but it is not compulsory on them to do so. Hence, in many instances, the surveyors neglect this most important work, and in some cases, even when called upon to remedy the evil, they take no steps to remedy it. The magistrates have no jurisdiction under the Highway Act to compel them to remove the nuisance. The effects of such neglect are obvious, and clearly shown ; the exhalations and offensive effluvia arising from the non-cleansing of such drains, producing fevers and other diseases, add to the miseries of the

54 Geo. III. c. 109.

*Drainage.* poorer inhabitants, and to the expenses, both of the parish and of individuals.\*

Highway Act.

Inconvenience of annual elections of officers.

The annual election of the executive officers greatly increases the difficulty of carrying out any systematic plan for drainage. All the surveyors and other officers retire from office at the end of each year: and, although re-eligible, are liable to be superseded by an entirely new set of officers, who, unacquainted with their duties, and the objects contemplated by their predecessors, may suspend improvements in progress, prevent the execution of many, or originate others in like manner to be superseded. This has been found to operate most prejudicially, and necessarily deters the existing officers from commencing works, which, owing to the limited sums annually applicable to these objects, can only be carried to perfection by a close adherence to a well-considered plan during a series of years.†

General want of legislative provision for drainage.

The most serious deficiencies in drainage are found to exist in those towns which have advanced within a brief period from the condition of villages, chiefly the seats of the pottery and iron manufactures in Staffordshire, and the mining districts in South Wales, Monmouthshire, and the north of England.

As an example of this description of towns, Merthyr Tydvil, at present containing above 37,000 inhabitants, presents the most lamentable instance of the total absence of all drainage.‡

The rapidly increasing suburbs of large towns which are without the municipal boundary, or to which the jurisdiction of a local Act does not extend, present similar examples of neglect, and strongly exhibit the necessity of the establishment of an efficient local authority for such purposes.

Limited objects of the earlier local Improvement Acts.

In the examination of those local Acts which have been transmitted to us from several towns, we find that most of those of early date do not contain any provisions whatever for the drainage either of streets or houses; such towns are in the condition of the class to which we have above adverted, and, if drained at all, are subject only to the inadequate provisions of the Highway Act. The objects provided for in these local Acts are generally the paving, lighting, cleansing, and frequently the watching, of the respective towns; and the

\* Evidence of Mr. Dean, First Report, vol. ii. p. 415.

† Communication from Board of Surveyors of Bradford, Yorkshire, Second Report, vol. ii.

‡ Report on Merthyr Tydvil, Second Report, vol. i.



Acts appear to have been framed more with reference to the means of traffic in the streets, and the general convenience of the inhabitants, than with any regard to their health.

An instance of the extent to which these deficiencies of legislative powers prevail, even in towns which have long been the resort of the wealthy and luxurious classes, is presented in the city of Bath.\* We there find that—

“The Commissioners for the outpart of the parish of Walcot have power, under a local Act, to order the construction of new sewers and the alteration and reparation of old ones when they see occasion: their power extends over about a fourth or fifth of the city. There is no such power vested in any body for the remainder of the city.”

In the city of Gloucester, although there are three Acts of Parliament in force for the local government of that city, none of them apply to the sewerage or drainage, which is in a most neglected state.

We have thus brought under notice some examples of the serious evils explained in our First Report, and refer, as further evidence, to the replies received from the towns visited, and the several Reports of the Commissioners.

To remedy evils of such magnitude, and so extensively prevalent, we are of opinion—**THAT NEW LEGISLATIVE MEASURES, APPLICABLE TO ALL TOWNS AND POPULOUS DISTRICTS, ARE REQUIRED, FOR THE INTRODUCTION AND MAINTENANCE—NOT ONLY OF AN EFFICIENT AND ECONOMICAL SYSTEM OF HOUSE DRAINAGE AND SEWERAGE, PAVING AND CLEANSING, IN ALL TOWNS AND POPULOUS DISTRICTS, BUT ALSO FOR PROVIDING AMPLE SUPPLIES OF WATER FOR PUBLIC AND PRIVATE PURPOSES, AND FOR THE ADOPTION OF OTHER MEANS FOR PROMOTING AND SECURING THE HEALTH AND COMFORT OF THE INHABITANTS.**

Necessity for the amendment of the law.

In considering the principles upon which a measure such as we have just recommended should be based, it will be convenient, first, to review the operation of the existing local Acts for drainage, and the efficiency of the local authorities intrusted with their administration.

Review of the operation of local Acts, and efficiency of their administration.

The powers given by local Improvement Acts are usually vested in a body of Commissioners, either elected by the rated inhabitants, or appointed by name in the Act, with a power to nominate their successors. The latter mode of appointment more frequently obtains in the older Acts of Parliament, the principle of legislation of the present day has caused the

Constitution of the existing local authorities.

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\* Evidence of the Town Clerk, Report on Bath, Second Report, vol. i.

Drainage.

introduction of a system of representation of the rate-payers, which has been inserted in most of the recent Acts, modified in various respects. It is most commonly provided that the election of one-third of the Commissioners shall take place every year.

Municipal Corporation Act, 5 & 6 Wm. IV. c. 76.

By the 75th section of the Act for the Regulation of Municipal Corporations, Commissioners acting under any local improvement Acts are empowered to transfer their powers to the municipal body. The instances that have been brought under our notice, in which this power has been exercised, are extremely rare. We believe that Manchester and Newcastle-under-Lyme present almost the only examples. The powers of the Improvement Act for Swansea, 49 Geo. III., were transferred by virtue of this provision, but another Act was passed in the last session of Parliament, vesting powers in the corporation jointly with 12 commissioners, appointed for life.

Leeds, 5 & 6 Vic. c. 104.

In a few instances, as at Leeds, the local improvement Acts vest the powers in the town council.

Liverpool, 11 Geo. IV. c. 15; 5 & 6 Vic. c. 26.

At Liverpool we find a variety of authorities intrusted with the administration of the local Acts for that town. The powers of the Acts for paving and sewerage streets are placed under a mixed body, composed of 9 members of the corporation and 15 commissioners, one-third of whom are elected annually. The provisions of these Acts do not, however, extend to the duty of cleansing the streets—a duty which is almost invariably found in other towns under the direction of the same authority as the paving and sewerage. This is here performed by the corporation, and is managed by a committee of that body, who derive their authority from three local Acts. The superintendence of buildings and the control over the width and drainage of courts and alleys are under the direction of a committee of the town council, which the Act requires to be appointed for that purpose. It will thus be seen that the duty of draining the *streets* is severed from that of draining the *courts* and *alleys*, and placed under the management of distinct bodies. It is unnecessary to point out the extreme inconvenience of such an arrangement.

21 Geo. II. c. 26.  
28 Geo. III. c. 13.  
5 & 6 Vic. c. 106.  
5 & 6 Vic. c. 44.

With the exception of the Metropolis, we have not met with any other instance in which the duties of the above description are placed under independent authorities with a concurrent jurisdiction within the same district, and possessing powers of a very different and somewhat inconsistent character.

Inefficient ad-

We have already pointed out some of the evils found to



arise in the operation of the Highway Act, by the uncertainty of the continuance in office of the surveyors and the other executive officers. In the course of the investigations in the country, notice was frequently called to similar evils, arising from the frequent changes of the authorities intrusted with the execution of the powers under local Acts.

*Drainage.*

ministration of duties partly due to uncertain tenure of office,—

The Commissioners acting under these laws, although generally continued in office for the space of three years, have scarcely time to become acquainted with their duties or to acquire a knowledge of the localities most demanding attention, before they are liable to be removed and their places filled by newly elected members, who have to go through the same course of instruction. It can scarcely be expected that any public works requiring much time for their completion, and to be executed upon a combined system, such only as will render drainage effectual, can be safely undertaken, while they are exposed to the risk of sudden interruption from a change in the constituent members of the body having control over them. In addition to these impediments, necessarily inherent in bodies thus constituted, the divisions of local parties, and the petty hostilities and jealousies too often in active operation in small communities, create obstacles to improvement which can only be overcome by the exercise of some competent and superior authority for the protection of the general interests of the public.

partly to local influence,—

Even where the necessity for improvements has been admitted, and the expense of obtaining a plan has been incurred; local influences have sometimes created an opposition and prevented its execution. The instance of the town of Derby\* presents a forcible example of the inability of the present local authorities to overcome such obstacles, if left to their own unaided and uncontrolled action.

We have received similar statements from the town of Leeds, for the drainage of which place an extensive and well-considered plan was laid down more than two years ago by a gentleman of great professional skill and experience,† but we are informed that no general or systematic proceedings have yet been taken in accordance with it.

The reports and information which we have received from other towns convince us that similar influences are generally in operation.

It is undoubtedly true that in many places a great part of

partly to inefficiency of the powers given by law.

\* Evidence of Mr. Roe, First Report, vol. ii. p. 407.

† Evidence of Captain Vetch, vol. ii. p. 432, *et seq.* Report on Leeds, Second Report, vol. ii.

*Drainage.* — the evils complained of arise from the insufficiency of the powers given by law for their removal, but we are unwilling to believe that the imperfect mode, and in some cases the absolute neglect of putting into execution those powers that exist, would be allowed to continue, where efficient laws are in force, if the local authorities had a more precise knowledge of the nature and magnitude of the injuries consequent upon their neglect, and were capable of applying the necessary remedies, the execution of which is too frequently impeded by the apathy of those in authority, the contentions of local parties, or thwarted by the opposition of interested individuals. In all the local investigations carried on under this commission, an increasing opinion of the very special nature of the works under consideration, and of the special provisions required for their execution, was manifested. In several towns where the present constituted authorities have fully and fairly entered into the consideration of the means of relief from the more pressing evils in question, they have concluded by avowing their conviction of the necessity of special and distinct administrative arrangements to provide for them.

These defects in the administration of the duties intrusted to the local authorities, appear to have suggested to many of the witnesses who have been examined before us, and to others from whom we have received much valuable information in the country, the necessity of a superior authority for supervising the execution of all local Acts relating to drainage, paving, cleansing, and other sanatory objects.\*

The importance of such a superior authority is also established by the concurrent testimony of all the visiting commissioners, proving how inefficiently the provisions of these Acts are carried into execution by the local authorities even where they exercise the powers intrusted to them. These defects are attributed generally to their imperfect knowledge of science, with reference to structural improvements, to the absence of the means of comparing, in point of execution and economy, works executed in their own vicinity with those in other parts of the kingdom, and to the opposition of party, and the supposed interests and prejudices of individuals with which they have to contend.

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\* First Report, Cubitt, vol. ii. p. 264; Austin, vol. ii. p. 347; Williams, vol. ii. p. 475; Arnott, vol. i. p. 50; Smith, vol. i. p. 36; Corbett; vol. ii. p. 324; Holme, vol. i. p. 271; Second Report, Birmingham—Letter from the Mayor of Birmingham, suggesting the advantage of a controlling power in certain cases; Merthyr Tydvil, vol. i.; Derby, vol. ii.



"We therefore recommend, that in all cases the local administrative body appointed for the purpose have the special charge and direction of all the works required for sanatory purposes, but that the Crown possess a general power of supervision."

*Drainage.*  
*First*  
*Recommendation.*

II. The first and most important step in providing for the efficient and economical execution of any plan of drainage, is the preparation of an accurate general survey, upon a large scale of the area which it is proposed to drain. This view is supported by a large mass of valuable and important testimony, proving it to be the necessary preliminary to any such work.\* The extent of country to be comprised within the jurisdiction of any local authority should be the entire natural area for drainage.

II.  
The importance  
of surveys for pur-  
poses of drainage.

At present no such plans or surveys are accessible to builders or others engaged in works requiring a knowledge of the level of the adjacent lands. Hence serious losses have been entailed on the public by the construction of sewers and drains at improper levels, and of a capacity insufficient for the probable wants of a future population; and houses have been placed in situations regardless of the means of drainage. Great loss and inconvenience from this cause have very generally occurred; and even very lately it has become necessary to enlarge and deepen some of the sewers recently put in.†

The prevailing want of information among the surveyors and other officers having the charge of the drainage of towns, regarding the levels of the sewers, and frequently even the entire ignorance of their existence, may be traced to the absence of any proper survey. At Bristol the first attempt to form a complete map of the sewers was commenced during the inquiry of the visiting Commissioners, and in the town of Preston it was a work of several weeks to open the streets in order to ascertain the lines and the depths of the sewers. In some large towns, as Wigan, Rochdale, and Bolton, there is not the slightest knowledge of the plans of the sewers.

We obtained the permission of the Commissioners of your Majesty's Woods and Forests to have a portion of the plan for the drainage of Windsor lithographed, to which we refer as a specimen of the scale, as to size, on which similar plans should be made. That plan was executed to accompany a report for the drainage of that town. The Commission has had the advantage of the evidence of Captain Vetch, in ex-

\* First Report, Evidence of Hawksley, vol. ii. p. 96; Vetch, p. 432; Dawson, 445; Williams, 447.

† Second Report, Evidence of Mr. Aspinall, vol. i.

*Drainage.*  
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*Surveys.*

planation of the value and importance of such plans laid down, as that is, with contour lines, or lines of equal altitude for the guidance of engineers and others in the execution of works of improvement.\*

The benefit of an authorized survey has already been demonstrated in devising a plan for supplying the city of Paris with water.†

It is manifest that no works can be executed on a system and with a proper attention to scientific arrangement, unless they are based upon a general survey, comprehending such levels as above described.

Builders of all classes have borne evidence of the great value of such a survey.‡

For laying gas  
and water-pipes.

The importance and the necessity of such surveys for the efficient execution of the usual works of improvement in towns is not confined to drainage. It extends to building, laying out and levelling streets, and laying down gas and water-pipes. At present, such surveys as exist having been generally executed under the direction of independent sets of surveyors and workmen, it necessarily happens that a survey made for the one purpose is either inapplicable for another within the same district, or that the private interests of parties limit the use of it to those at whose instance it was made.‡

Want of authen-  
ticity in existing  
surveys.

The partial surveys hitherto made for the above limited purposes having been executed by private persons not acting under any public authority, possessing no authenticity as to accuracy, have been serviceable only for temporary purposes, and no steps have been taken to record the levels. The engineers examined by us have represented the importance of securing a permanent record of these levels, by the insertion of bolt or bench marks, having reference to some common

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\* First Report, Evidence of Captain Vetch, vol. ii. p. 432. The following is his description of the advantage of contour lines upon a plan—"The ground plan of a town shows the exact dimensions and relative distances of spaces, but gives no knowledge of their absolute heights above a fixed common point, or datum, or the relative heights between any two sites on the plan, but when the horizontal plan exhibits those contour lines drawn, say at every four feet, and marked 0, 4, 8, 12, 16 feet, we see at one glance all the places situated at their respective elevations above datum, and know their relative heights above each other." "An engineer can therefore see without any trial levels the undulations and descent of each street from one contour line to another, and he knows the amount of cutting and filling to reduce the street to a level or regular incline."

Of the assistance that they would afford to builders, he states—"If new streets be laid out, the engineer will perceive at once, from such a plan, the declivity and aspect of the building ground, and the best line of drainage adapted for them."

† First Report, Evidence of Mylne, vol. ii. p. 101.

‡ First Report, Evidence of Little, vol. ii. p. 307; Corbett, vol. ii. p. 324.



datum in the chief public buildings and other convenient places in towns, and in this we fully concur.

*Drainage.*

*Surveys.*

Such bench marks might be inserted at distances of not more than 100 yards, and if placed at the corners of streets and in other convenient situations for the ready reference of builders and others, would be available for many of the purposes of more complete surveys, and would materially lessen the inconvenience stated to arise from their absence. The construction of all public works might be regulated by them, and the repetition of the process of levelling in most instances be dispensed with. But to insert these marks sufficiently close together so that they should be serviceable to unscientific workmen, it would be necessary to place them on many private as well as public buildings. And in order to obtain the general confidence of the inhabitants in the correctness of the surveys and the levels thus permanently marked, the work should be conducted under the superintendence of some disinterested authority, independent of all local conflicting interests.

In those parts of the northern counties of England, where the Ordnance survey is still in progress, there appears to be an opportunity of obtaining surveys for sanatory purposes, executed by public officers under a system of control and checks, calculated to ensure a degree of accuracy, which it is very difficult to attain in any other manner, and which will acquire for this work a permanent authenticity and confidence. We are more anxious to recommend that the services of these officers should be made available for such purposes in those districts, where the surveys for the Ordnance map are not yet completed, as, we believe, that independently of their accuracy, the work could be executed by them at a comparatively trifling cost, provided the additions to the plans of towns, necessary for sanatory purposes, be made while the surveys for the Ordnance map are in progress.

Surveys under  
the Board of Ord-  
nance.

As an example of the difference in the cost of surveys, lately made under the provisions of the Tithe Commutation Act, on which the levels are not shown, as contrasted with the cost of those executed by the Ordnance, we would cite the evidence given to us by Captain Dawson,\* who has the superintendence of the maps in the Tithe Office. He has informed us that the cost of the tithe survey for the parish of West Hackney, which comprises some rural districts, was at the rate of 16s. 6d. an acre, and that for St. Clements Danes

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\* First Report, Evidence of Captain Dawson, vol. ii, p. 443,

*Drainage.*  
Surveys.

parish, which is exclusively urban, was at the rate of 5*l.* 13*s* per acre. By the favour of the Master-General of the Ordnance we have been furnished with a Table, which we appended to our First Report,\* showing the estimated cost of surveys executed under the direction of that Board. From this it appears that the cost of surveying such a parish as St. Clement Danes, and laying down contour lines, with the sewer, gas, and water pipes, would not amount to more than 8*s.* per acre, but that if such additions were made while a survey for the Ordnance map was in progress, the extra cost would be reduced to 1*s.* 4*d.* per acre, or to 6*d.* only, if the levels merely are taken and bench marks inserted; the scale in that instance would be 60 inches to the mile, but it appears that the extent of the scale would scarcely make any appreciable difference in the cost.†

We have given the above examples to illustrate the economy that may be effected in the construction of a survey, when one upon the most complete scale is required either for a town or populous district. In many places it will be sufficient for future reference, that the levels taken be rendered permanent by the insertion of bolt or bench marks in proper and convenient situations in the manner already mentioned.

The amount of surveying required for the extensive arrangements, that may be commenced simultaneously in different parts of the kingdom, must render a much larger force necessary than the present corps of Royal Engineers can supply, should plans for improved drainage be introduced to an extent even far inferior to that which the urgency of the case demands. Whatever expedients may be adopted for procuring local assistance, in which there appears to be no difficulty, we entertain a strong conviction that such surveys should be conducted, and their accuracy tested, by some competent and independent person nominated for that purpose.

The facilities that we have shown to exist for obtaining complete surveys for drainage and other sanitary purposes, at a very small charge upon the inhabitants of the district, through the medium of the Ordnance department, where the surveys are in progress, will, we trust, induce the local authorities in those districts to take the proper steps to procure

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\* First Report, vol. ii. p. 484.

† This cost would vary in a trifling degree, according to the density of the dwellings and population in a given area, but it has been calculated that for laying down the levels an outlay of from 30*l.* to 40*l.* would be enough for the average size of towns containing 20,000 persons; from 100*l.* to 120*l.* for towns of 60,000; and from 200*l.* to 250*l.* for those of 120,000 inhabitants.



them without further delay. It does not appear that, with the exception of the plans for Leeds and Derby, to which we have already alluded, any surveys for the purposes of drainage have been made at the instance of the local authorities in any towns or populous districts in England and Wales.

*Drainage.*  
*Surveys.*

If the recommendation that we shall presently submit should be carried out, and a survey be conducted under the direction of an authorized person, independent of local interests, it would afford an opportunity of obtaining a report upon the state of the town, showing its condition in all respects relating to sanitary subjects, and whether the existing defects may be attributed to the deficiencies in the provisions of the general or local law, or to the negligent execution of it.

Although we have previously recommended the enactment of a general measure for drainage and other purposes of local improvement in towns, we anticipate that peculiar circumstances will arise where it may become necessary to apply to Parliament for a local Act. In such cases a report of the kind stated ought to be the preliminary step, and would be a valuable aid both to the promoters of the measure itself and to the members of the legislature, when called upon to decide upon its merits.

The necessity of  
special Improve-  
ment Acts.

“ We therefore recommend, that before the adoption of  
“ any general measure for drainage a plan and survey  
“ upon a proper scale, including all necessary details,  
“ be obtained, and submitted for approval to a com-  
“ petent authority.”

*Second  
Recommendation.*

III. In the course of our investigations in the country, frequent instances have been brought under our notice of the difficulties arising to a complete system of drainage by the impediments that exist, whether natural or artificial, beyond the present limits of the jurisdiction of the local authority. No means are at present provided for the gradual enlargement of the jurisdiction simultaneously with the extension and the increasing wants of the newly-built districts of towns.

III.  
Evils arising  
from limited ju-  
risdiction for  
drainage.

If an extended district be included within the local Act, persons must be taxed for objects, unnecessary among a rural population ; if the limits are confined to the existing town, as we find to be generally the case, the increasing suburbs are left without any provision for their drainage or other measures, concerning their sanitary improvement and regulation.

Such wants cannot now be supplied without the expensive and uncertain process of an application to Parliament for a local Act in each case. All the evils apparent in the older

*Drainage.*

parts of the town are consequently created anew in the suburbs, to be repaired, at some future period, at a considerable increase of cost, and frequently at some sacrifice of property.

Limited jurisdiction.

The first obvious circumstance commonly presented on the examination of a badly drained town is, that the boundaries of the districts, under the jurisdiction of the authorities charged with the execution of the drainage, are so unsuitably assigned as to prevent any such works being carried out systematically and effectually. All such works, to be executed economically as well as efficiently, it need scarcely be stated, must comprehend the whole of the masses of houses and buildings in the natural area for drainage in which that town may happen to be seated, and to this must be added the command over the natural outlets. Either from the want of means, or other causes, for ascertaining and defining the proper natural limits of the jurisdiction for drainage, previously to constituting the authorities and investing them with the necessary powers, it has generally been found that the boundaries adopted actually comprehend only a part of the natural and therefore proper drainage area, and that the suburbs of towns, containing a large proportion of the population, are excluded from any jurisdiction or regular provision whatsoever.

Drainage districts often comprehend only parts of the houses of populous districts;  
At Bath.

Thus it is shown on the examination of the drainage of Bath,\* that the only authority having powers for the construction of new or the reparation of old sewers, was constituted by a local Act, authorizing the appointment of Commissioners, whose powers were restricted to the parish of Walcot, containing about one-fourth or one-fifth of the whole population. Many towns might be mentioned in which the *houses* of the suburban portions, and even in the town itself, have, as in this instance, never been brought within any jurisdiction whatever, and which depend for such imperfect drainage as they possess upon the casual creation and exercise of imperfect authority under the General Highway Act to drain highways, cleanse ditches, and open water-courses. Examples of this defect prevail to a most lamentable extent in the Metropolis and its suburbs.

And rarely comprehend more than parts of the natural area for drainage on which the houses are situate.

The case of the large village, or rather the small town of Tottenham, which has a population of about 9,000 inhabitants, will serve as a comparatively simple example of another large class of cases, where an insufficiency in the area

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\* Report on Bath, Second Report, vol. i.



included in the jurisdiction for drainage operates as a barrier almost insuperable to the execution of effectual works by the most competent officers.\* *Drainage.*

Liverpool is surrounded with undrained tracts of land, At Liverpool. over which the suburbs, with new habitations for the working classes, are in the course of extension; and new houses are being built beside stagnant pools beyond the jurisdiction of the town drainage. The interior of the proper area of drainage comprising the town itself is split into two districts, and those districts are placed under divided and imperfect authorities, so clashing with each other as to render systematic drainage impracticable.†

‡ Much of the proper drainage district, within which the At Manchester. town of Manchester is situated, consists principally of clay, wet and overrun with rushes, and of partially drained land. The interior of the area containing the town itself is subdivided into jurisdictions, partly municipal and partly parochial, utterly inconsistent with any natural limits for drainage. The officers acting within these limits are invested with imperfect powers, and have no authority whatever over the river, which flows through the town, and is dammed up, giving off emanations to which the fever prevalent amongst the population resident on its banks is attributed. The chairman of the Committee of Sewers in Manchester complained that the proper drainage and improvement of the worst district in that town, inhabited by the poorest population, is prevented by the want of authority over the dams thrown across the river Medlock, which, in consequence of these dams, at times overflows the lower districts.†

It was found that one source of the insalubrity of the town At Bradford. of Bradford, which is situated in a valley between two hills, was traced to the emanations arising from the natural water-course running between the hills, now dammed up for mill-power, and made the receptacle for all the drainage of the houses. The escape of gas from this source was stated to be at times so considerable as to discolour silver in the habitations or workshops near its banks. Over this outfall there was no proper authority possessed or exercised for the public protection.

The outfall of the surplus water of the drainage of Halifax At Halifax. was found to be similarly dammed up.

The inspection of Leeds, showed (as had been previously At Leeds.

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\* Evidence of Mr. Dean, First Report, vol. ii, p. 415.

† Report on Towns in Lancashire, Second Report, vol. i.

*Drainage.*

Consequence of original defect of jurisdiction over the natural drainage area.

stated by Captain Vetch, the engineer called in by the local authorities to examine and report on the means of improving the health of that town) that the river Aire, which would in its natural state have had a strong and regular current, had been dammed up in several places for mill power, and for the purposes of an important water communication. These dams thus act as a series of catch-pits for the sewage of a population of 120,000 persons. In this case, also, the authorities having control over the town drainage, even if they had been so constituted as to have been competent to execute or maintain systematic works, would have no jurisdiction or control over the natural outfalls; and, in consequence of this original want of jurisdiction and care, rights have apparently been acquired which can now only be fairly redeemed, for the relief of the town, by purchase. It may be observed, however, as a favourable circumstance, that at the present time the increasing cheapness and convenience of substituting steam power would, in many localities, greatly facilitate the resumption of important public rights, and the extension of proper drainage jurisdictions over natural outfalls.

*At Lancaster.*

At Lancaster\* the upper portion of the drainage area was found to be under the control of the authorities who have charge of the Castle, and who were endeavouring to improve its salubrity by a better drainage. In this they were obstructed by the officers having charge of the lower portion of the area, who refused to permit the authorities having charge of the upper portion to use the sewers forming the proper outfalls.

*At Nottingham.*

The artificial drainage area under the care of the authorities having charge of the drainage of the town of Nottingham,† comprehends only a portion of the natural and proper area. One part of that area is above the site of the houses of the town, within the municipal jurisdiction; and another part, comprehending the outfalls of the drainage of the uplands, and of the town itself, is beneath it, and partly without the municipal jurisdiction. This subdivision of the natural area is found to be attended, as it has been almost everywhere, by the creation of rival and clashing interests, and with mutual and general injury to the inhabitants, and to the houses and land within the natural area, or contiguous to it.

At Norwich a part only of the natural drainage area is held by the commissioners having charge of the drainage of

\* Report on Lancaster, Second Report, vol. ii.

† Report on Nottingham and other Towns, Second Report, vol. ii.



the town. In the upper portions of the town there are stagnant pools of water, for which relief by the natural outfall, through the municipal jurisdiction, was refused by the city commissioners, the sewers for that portion of the area being ill-constructed, on rude conceptions of what was deemed sufficient for that portion only of the district. It was considered by the commissioners that these sewers were insufficient for the reception of the additional upland drainage; and yet no alterations were proposed for the relief of the inhabitants of the upper portion of the area, it not being understood, or apparently not considered, that a lower district benefits by the increased rapidity in the force of the flush, for cleansing purposes, by all ordinary additions of upland waters.

*Drainage.*

Limited jurisdiction.

At Leicester,\* the natural water-course of the town is obstructed, dammed up, and converted into a sluggish receptacle of a large proportion of the sewage from the town, and in a great measure formed into a barrier to the effectual drainage of the low and flat site on which the chief part of the town is built.

At Leicester.

At Coventry† the drainage of the natural area is similarly obstructed by mill-dams within the city, and the effluvia from them have formed the subject of loud and just complaint for many years past, but no proper authority or available remedy is apparently provided.

At Coventry.

In this class of cases the pernicious effects arising from the miasma generated in such stagnant waters would doubtless be much diminished by the conveyance to a distance and the application of the liquid manure, which is thrown into them and wasted; but, in the instances of surveys which have been made for the purpose, and have contained suggestions for the profitable disposal of the drainage water,† it has been ascertained that the outfalls for its conveyance in the most convenient direction for useful application, or probable demand, would generally be found to be even beyond the limits of any existing area of local jurisdiction.

Extended areas requisite for the outfalls, for the removal and application of the refuse of towns.

In submitting these examples in illustration of the evils arising from the limited jurisdiction now granted to the local authorities intrusted with the charge of the drainage of towns, we do not undervalue the importance of several measures of immediate relief, in mitigation of existing evils, which may generally be taken within existing drainage districts, however imperfect. It will, however, be perceived that it is essential

\* Report on Nottingham and other Towns, Second Report, vol. ii.

† Evidence of Captain Vetch, R.E., First Report, vol. ii. p. 138; Mr. Roe, vol. ii. p. 176.

*Drainage.*  
 Limited  
 jurisdiction,

to the proper execution of all effective works of drainage, as well as of those for cleansing (as we shall afterwards show), and of the works for the supply of water, and of those connected with or dependent on drainage, that they should be laid down and connected with reference to well-defined natural boundaries, and that the system of sewerage must be based upon well arranged main lines.

Cases will arise when it will be necessary for the effectual drainage of a town to convey the sewers through private lands to a distant point of discharge, but it may not be just to charge the whole or any portion of the expenses on such lands; the powers required in such cases would be the same that are now granted by Parliament in most local improvement Acts, enabling the Commissioners to carry drains through private lands on paying compensation.

For the protection, however, of such interests, we contemplate that, in each case, the necessity for an extension of jurisdiction should become the object of a special inquiry made on the spot, under the direction of some competent and independent officer, not unduly influenced by local views or considerations. An inquiry conducted by an officer acting under the Crown, would be a means of providing a better security than even now exists, against a wanton and unnecessary invasion of private rights. The present mode of initiating and passing private Acts, and the expense that must be incurred by individuals, either in prosecuting their own claims or in opposing those of others before Parliament, would be materially diminished by the intervention of a competent authority, to procure a preparatory report on the measure, and inquire into the claims to compensation and the equitable distribution of charges.\*

*Third  
 Recommendation.*

“As a remedy for these evils, and to render unnecessary  
 “the frequent applications to Parliament for additional  
 “powers and extension of jurisdiction, we recommend  
 “that the Crown be empowered to define and to en-  
 “large from time to time the area for drainage  
 “included within the jurisdiction of the local admi-  
 “nistrative body.

IV.  
 On the qualifica-  
 tions of officers,  
 and the power of  
 the Crown over  
 their appoint-  
 ment.

IV. In the present system of local government, the administrative duties of local improvement Acts are frequently placed under the immediate direction of persons, who are seldom qualified by any professional education for the direction of scientific works. They are therefore dependent upon the

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\* First Report, Evidence of Mr. Hawksley, vol. ii. p. 94, *et seq.*; Mr. Dean, vol. ii. p. 422, *et seq.*



acquirements of their officers for the necessary skill in the planning and efficient execution of the works. *Drainage.*

Before such extensive works of drainage as we have shown to be requisite for the cure of the existing evils are carried into execution, it will be necessary to provide some security for the appointment of officers of higher qualifications than have hitherto been required of persons intrusted with these duties.

Qualifications of officers.

In the course of our observations on the operations of the Highway Act, we have already pointed out some defects, arising from the surveyors under that Act being subject to an annual election, an uncertainty in the tenure of office, which most materially interferes with its efficient execution. By the provisions of this Act, the office of surveyor is made compulsory, and the person elected by the vestry is rendered liable to a penalty of 20*l.* for refusing to undertake it. No qualifications of knowledge or especial skill can be required under such circumstances. We apprehend, however, that in populous parishes, advantage is sometimes, though but rarely, taken of the clause enabling the vestry to appoint a person of "skill and experience" whose services they have power to remunerate with a salary; but he also is only an annual officer. It is scarcely possible to obtain the services of an efficient and skilful officer, unless he be secured against a capricious removal from his office, and the annual election to which the surveyors of highways are now subject, naturally deters men of competent ability from aspiring to it. The most efficient men, finding ready occupation elsewhere, reject such employments: they are necessarily undertaken by men little qualified for the duties, who possibly, having been unfortunate in some other business, are glad to obtain, by the support of a numerous body of friends, any description of employment.\*

Causes of the inefficiency of the existing class of officers.

The local Acts are uniformly more deficient than the Highway Act in requiring any qualifications; they do not advert to the necessity of "skill and experience," and many of them even omit to allude to the office of surveyor.

The importance of ensuring due qualifications of skill and experience, and rendering the officers sufficiently independent, has been strongly urged upon us by persons who have had great experience of the present mode of appointment, and the insufficiency of the works executed by the present class of

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\* Sheffield, Second Report, vol. ii.; evidence of Mr. Dean, First Report, vol. ii. p. 416.

*Drainage.*  
Appointment of  
 officers.

officers. The evidence produced before us affords ample proof of the correctness of these views.\*

The construction of such works, being commonly considered as incapable of improvement by the application of scientific principles, is frequently intrusted to the most incompetent and inefficient persons. These, again, are under the control and direction of bodies equally unskilled, and constantly changing. The works are consequently executed without any attention to economy, and without the slightest regard for the future wants of the districts. The needless expenditure of money thus caused is afterwards exhibited by the alterations and amendments rendered necessary. All local works of improvement should be planned, and their execution superintended, by a person having a competent knowledge of engineering. New subjects, connected most closely with the general health of the community, are now constantly attracting the attention of persons engaged in works of construction. The importance of the questions of ventilation and warming having been fully established by recent investigations, particularly demands the attention of the architect and engineer. The important duties, which may in future devolve upon the officers charged with the construction of works, and the large discretionary power that must be vested in them, will undoubtedly render it necessary to establish some mode of testing the competency and qualifications of persons offering themselves as candidates to fill such situations. Some assurance should be given to the public that the persons intrusted with these responsible duties are properly qualified.†

By the Act for Regulating Buildings in the Metropolis, candidates for the office of district surveyor are required to undergo an examination, and their appointments are subject to the approval of the Secretary of State. These appear to be principles that may be beneficially extended.

The duties are, however, all of a kind which calls for the same acquirements of professional knowledge, and an acquaintance with them would be found combined in any person properly educated in these respects. One such officer may, therefore, easily superintend the execution of the several duties to be placed under the direction of the local administrative body. Among other important advantages of such an arrangement, it will afford the opportunity of obtaining the

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\* First Report, Evidence of Mr. Biers, vol. ii. p. 282; Mr. Bratt, vol. ii. p. 308; Mr. Hickson, vol. ii. p. 232.

† First Report, Evidence of Mr. Butler Williams, vol. ii. p. 476.



services of efficient and experienced officers, who, as they will be intrusted with numerous important duties, may be remunerated (at least, in many of the towns and districts) on a scale of such liberality that they may be persons of considerable professional skill and acquirements, and may fairly be required to give their entire services to the public. We feel assured that their suggestions will be more readily acquiesced in if they are independent of private practice within the district under their charge.

*Drainage.*

Appointment of officers.

We are desirous of stating our opinion that an auditor should in all cases be appointed, and that especial care should be paid in deciding upon the qualifications for that office. It is essential, for the efficient execution of his duties in checking fraud or profuseness of expenditure, that he should be perfectly independent of the body whose accounts he is appointed to control.

Office of Auditor

" We, therefore, recommend that the local administrative body appoint the executive and other officers under it; that the appointment and dismissal of the chief surveyor be subject to approval; that such officer produce proof of his qualification for the office to which he shall be appointed, and, if required, be subject to an examination."

*Fourth Recommendation.*

V. Having stated our views of the necessity that the Crown should exercise a power of supervision and direction over the local administrative bodies, in the execution of the laws for sanatory improvements, in cases where they are willing to exercise such new powers as may be granted to them, we now bring forward the mode of proceeding, which we recommend to be adopted in towns or populous districts, where grievous evils are proved to exist, and where the present authorities, or future administrative bodies, delay, or refuse to take measures for their removal.

V.  
On the compulsory powers of the Crown.

There may be cases in which the local bodies will continue inactive. The contentions of parties and the influences of local interests frequently impose a serious obstacle to the adoption of sanatory measures attempted and brought forward, by the administrative body, or by the intelligent and influential inhabitants. A large class of persons is constantly prepared to act in opposition to any scheme of improvement, from the unfounded fear that their interests will be affected. Such persons frequently obtain great influence in the decision of questions in relation to any alterations calculated to effect improvement in the condition of the working classes.\*

Obstructions to improvements from conflicting local interests.

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\* First Report, Evidence of Mr. Hawksley, vol. ii. p. 92.

*Drainage.*

Compulsory  
powers of the  
Crown.

The instances of the delay, if not the indefinite postponement of the execution of the plans for drainage, to which we have already adverted, afford an illustration of such impediments.\* The objections that prevailed in these instances appear to have been founded upon the amount of the immediate outlay required for the improvements. Statements of a similar tendency have been forwarded to us from other towns.

Increasing diffi-  
culties arising  
from delay.

There can be no doubt that a complete and effectual cure for the wide spread evils cannot be accomplished without a considerable outlay. We shall presently show how the immediate pressure of the burthens may be lightened. The neglect of former years has produced a necessity for an accumulation of new works which should have been long since executed by the past generation. Continued delay will only increase the difficulty.

Captain Vetch,† in his report upon the drainage of Leeds, presents an example of the rapidly increasing difficulty and expense of carrying into effect any extended measure of drainage in large towns. In that instance he found the proper courses for the drainage of some of the lower portions of the town still open and unobstructed, but the increase of buildings, and the formation of new streets, were rapidly extending across some of the low grounds, so as to cut such courses off from their natural outlets.

In all towns the same difficulties must be daily increasing, and ought alone to operate as a sufficient inducement to active and immediate exertion. But in addition to these mere arguments of economy, we may urge the much higher motives of duty. In the commencement of this Report we have stated facts, proving the enormous loss of life, besides the injury to health sustained by the continuance of the various evils, which might, in many instances, be removed by the zealous exercise of the powers at present existing or to be granted by any future law.‡

We rely with confidence on these arguments to prove the necessity for speedy improvement, and we offer it as our opinion, that it is necessary that strong and effectual measures should be adopted to ensure amendment. We are further confirmed in this view by the numerous instances, to which we

\* Derby and Leeds, Second Report, vol. ii.

† Captain Vetch, vol. ii. p. 436.

‡ First Report, Mr. Holland's Report, Chorlton-on-Medlock, vol. i. p. 205; Mr. Hawksley's Report on Nottingham, vol. i. p. 330; Mortality in Leicester, vol. i. p. 269. Second Report, Report on Towns in Lancashire.



shall presently more particularly refer, of neglect on the part of the local authorities to exercise the powers vested in them for the benefit of the inhabitants of their respective districts.

*Drainage.*  
Compulsory powers of the Crown.

Deeply impressed with the importance of this necessity, we have given our most anxious consideration to the means of ensuring the execution of measures for improving the physical condition of the labouring classes, when the local authorities, having power for such purposes, neglect to put them into operation.

No power at present exists rendering any body liable to punishment for the non-execution of duties involving measures for promoting or securing the public health. It is made the duty of inhabitants of parishes to repair the highways, and they are liable to an indictment for neglect, but this responsibility has not yet been extended to any measure for securing the public health. The causes of disease are now sufficiently traced to prove that the means of removal of some of them are within reach, and may be attained by the active exercise of the authority already given. On these grounds we are of opinion that the public welfare requires that the inhabitants should be made responsible for the execution of the duties imposed upon them by law, for sanatory objects, on the same principle as they are now liable, for the public benefit, to repair the highways.

Want of responsibility on the part of local authorities for not executing the provisions of local Acts.

The grievance to be cured is a heavy one, and presses with most severity on the poorer classes, who have no means within their reach of remedying the evils under which they labour. It therefore becomes the duty of those who have the immediate local charge of the district to use the powers that the Legislature has granted to them; and in case they neglect this duty, those still higher in authority are bound to see that it is performed, and, if necessary, to call upon the Legislature for aid.

The conclusive facts that have now been made public by this and former inquiries, showing that extensive evils prevalent in all large towns are capable of removal, should induce all persons in authority to exercise with vigour and effect whatever power now exists, or that the Legislature may grant; but we should be remiss in our duty if we did not express our firm conviction that the same system of inaction and negligence that has hitherto so extensively prevailed, will recur, unless such a power to enforce the execution of the law, as we now recommend, shall be established.

“ On these grounds we recommend that, upon representation being made by the municipal or other

*Fifth Recommendation.*

*Drainage.*

“ authority, or by a certain number of the inhabitants  
 “ of any town or district, or part thereof, setting forth  
 “ defects in the condition of such place, as to drainage,  
 “ sewerage, paving, cleansing, or other sanatory  
 “ matters, the Crown direct a competent person to  
 “ inspect and report upon the state of the defects, and,  
 “ if satisfied of the necessity, have power to enforce  
 “ upon the local administrative body the due execu-  
 “ tion of the law.”

## VI.

Powers and du-  
 ties of the local  
 authorities.

VI. Having brought under review some of the most serious defects in the state of the existing laws, and of their execution, and offered such recommendations as appear to us adapted for their amendment, and to ensure their efficient operation, we proceed to state the powers and duties which we propose should be vested in the local administrative bodies, to be appointed for carrying into execution the suggested measures.

We have already explained the necessity for a general survey of the natural area for drainage, for giving a power to extend under certain restrictions the jurisdictions, and for enlarging the limits, from time to time, of any district that may be defined under the proposed amendment and extension of the law.

Under that branch of the subject we had occasion to cite several instances of inconvenience, which were brought to our notice, arising either from the limited extent of jurisdiction or from conflicting authorities in adjoining districts. We confined our observations to a statement of the advantages that the engineer would obtain by the extension of the jurisdiction, enabling him to carry the sewers to a distant outlet, where the peculiarity of the ground, or other circumstances, require it, and to diminish the impurity of streams, now so frequently polluted by the increasing quantity of house-drainage.

Inconvenience of  
 conflicting juris-  
 dictions—

The towns visited present but few instances of more than one set of Commissioners appointed under a local Act with powers for drainage;—Birmingham, Manchester, and Liverpool, and a few other towns, form exceptions. The local Acts, however, rarely comprise the whole district covered with buildings, &c., commonly known as the town, and it constantly happens that portions of every town are under the inefficient provisions of the General Highway Act.

At Birmingham.

The replies from Birmingham, made by the mayor and a committee of inhabitants show that “ for lighting, paving, cleansing, &c., the borough is under the management of three distinct bodies of commissioners having jurisdiction



under several local Acts of Parliament, and four distinct Boards of Surveyors." In the parish of Edgbaston, described as a most important part of the borough, there is no local Act, and "the three hamlets, besides the Commissioners under the local Acts of Parliament, have each a Board of Surveyors under the Highway Act." It is also stated that "there is no co-operation or uniformity of proceedings as to paving, lighting, cleansing, &c., between the eight local authorities within the borough."

*Drainage.*

Conflicting jurisdictions.

At Manchester the several townships within the borough are under distinct jurisdictions, but only four have local Acts.\* The powers under some of these Acts have been transferred to the Town Council under the provisions of the Municipal Corporation Act, and although such districts are governed by one body, they are still under different local laws, while the other townships in the borough remain under the general law, although they stand equally in need of special legislative provision.

At Manchester.

At Liverpool† we find the following bodies:—Commissioners appointed for the general sewerage and paving of the town, and the townships of Everton and Kirkdale; a Committee of the Town Council, acting under the 5 & 6 Vict. c. 44, appointed for the sewerage and paving of courts exclusively, and another set of commissioners for the extra-parochial district of Toxteth Park,‡ now a part of the borough. These Acts do not include the duties of scavenging, of superintending the erection of buildings, or of providing a supply of water for protection from fire. These duties are executed by the Town Council under three different Acts of Parliament. The inconvenience of these separate jurisdictions seems to have been felt in regard to the drainage of different parts of the borough and parts adjacent, as we find a provision in the Toxteth Park Act to enable the commissioners for the town of Liverpool to permit the drainage from the Toxteth Park district to be brought into the sewers under their jurisdiction. The same inconvenience appears also to have been experienced in other parts of the town. In the Act passed in the year 1843, empowering the Commissioners of Sewers to obtain a supply of water, a clause is inserted, pro-

At Liverpool.

\* Manchester, 11 Geo. IV. c. 47; Chorlton, 2 and 3 Wm. IV. c. 90; Ardwick, 6 Geo. IV. c. 5; Hulme, 5 Geo. IV. c. 95. The powers under the Acts for Chorlton and Ardwick have been transferred to the Town Council of Manchester.

† 2 Geo. IV. c. 15; 5 and 6 Vict. c. 26; 6 and 7 Vict. c. 75; for supplying water for fire and streets only.

‡ 5 and 6 Vict. c. 105; 5 and 6 Vict. c. 104; 6 and 7 Vict. c. 105.

**Drainage.**  
**Conflicting**  
**Jurisdictions.**

fessedly with the object of giving facilities for the extension of drainage in the neighbourhood of the town, and beyond the jurisdiction of the town commissioners. By this clause the commissioners are empowered to permit the owners and occupiers of property beyond the limits of the town to bring their sewers and drains into the public sewers on payment of a reasonable charge.\*

The several commissioners at Liverpool have thus endeavoured to aid the drainage of the adjacent districts, by the introduction of these permissive clauses, but those in the lower districts cannot control the amount of water that will be delivered into their sewers, or calculate the quantity for which they must provide; neither have those in the upper parts any power over the levels of the sewers. It is evident that no efficient system of drainage can be carried out, so long as such impediments from artificial boundaries and conflicting jurisdictions are allowed to continue.

Clauses in the  
 General High-  
 way Act for

We have previously stated that the power given by the General Highway Act for the formation of parishes into dis-

\* TABLE showing the want of Consolidation, and inconsistent powers of the various authorities appointed under the Local Acts for Liverpool.—Report on large Towns in Lancashire.

Corporation.			
1 Health Committee.		2 Cleansing Committee.	3 Fire Committee.
Does not include the management of cleansing or sewerage streets, but interferes with authority No. 5 in paving and sewerage courts, and extends for this purpose over the district of Toxteth Park. Does not possess the natural connexion between authorities 2, 5, 6.		Has no connexion with sewerage or with watering the streets, and therefore is ineffective by interfering with, and being interfered by, authorities 1, 4, 5, 6.	Possesses charge over fire police, and yet has no charge over the water, brought in at an immense expense, for the extinction of fire. Is dependent, therefore, upon 4, a distinct and independent authority.
Commissioners of Sewers.		Two Water Companies.	Toxteth Park Commissioners.
4 Water Department.	5 Sewerage and Paving.	6	7
Water brought in to the town for extinction of fire and watering the streets; interferes, therefore, with authorities 2 and 3, and, if applied to public fountains, with duties of 1.	Confined to streets alone, but not extended to courts, and is therefore, interfered with by authority No. 1. Possesses compulsory powers with regard to main-drainage, but not with house-drainage.	Both in opposition,—compelling, from their supposed inefficiency, the introduction of new water (4) for the extinction of fire; and, from the inadequacy of domestic supply, prevents the proper action of sewers, and hence interferes with authorities, 1, 2, 3, 5, 7.	Causes the expense of separate management for various offices which might be comprised under one or more of the previous authorities by an extension of the existing natural area.



tracts for the purposes of the Act, is but rarely adopted. The necessity of enforcing the formation of districts, without regard to parochial or municipal boundaries, so as to comprise the natural area for drainage, has been strongly pressed upon our attention. Such an enlargement of the jurisdiction will at the same time afford the further advantage of remunerating officers at such a rate as to command the services of persons of higher qualifications, whose whole time should be devoted to the superintendence of this and the other duties to be intrusted to them.

*Drainage.*

forming districts not made available.

“ For these reasons we recommend, that the management of the drainage of the entire area, as defined for each district, be placed under the jurisdiction of one body.”

*Sixth Recommendation.*

VII. We have already adverted to the serious injury to health, caused by the filthy condition of streams passing through large towns, and we cited as an example the statement of Mr. Binney, describing the state of the streams at Manchester. That gentleman has prepared a map, which is appended to his report, showing how largely these evils are aggravated by the numerous weirs and dams which have been erected from time to time for manufacturing purposes, and which, by interrupting the natural course of the streams, form a series of ponds highly charged with most offensive matter. The injury thus caused to health, as well as the obstructions to the natural drainage, have been fully described in the report on Manchester, to which we refer for the account of the extensive physical evils thus produced.

VII.  
On the injury arising from mill-dams, and the necessity for the purchase of water rights.

Obstructions to drainage at Manchester.

The city of Coventry presents another forcible example of this evil, to which our attention has been earnestly directed by the mayor and town council.\* It appears that as long ago as the year 1831 a report was made by an eminent engineer, on the obstructions and the nuisances created by the mill-dams in that city. Evils of this character prevail in many places, and obstruction will occasionally arise to the execution of a measure for drainage, unless provision is made to empower the local authority to raise money for the purchase of the rights in those instances where they produce injury.†

At Coventry.

As the execution of such a power will generally involve the outlay of a considerable sum of money, we propose that it should not be exercised without the sanction of the Crown.

We do not, however, disregard the consideration, that in

\* Coventry, Second Report, vol. ii.

† Evidence of Mr. Dean, First Report, vol. ii. p. 420.

*Drainage.*

many cases where the jurisdiction is sufficiently extended, the best and most efficient method will be to alter the course of the main-sewers, so as to be independent of the streams, and relieve them of the present causes of pollution. Thus the purchase of mill rights may, in many cases, be rendered unnecessary, and the contents of the sewers may, at the same time, be conveyed to a distance for profitable use as manure.

*Seventh  
Recommendation.*

“ With this view we recommend that the local administrative body be empowered to raise money for purchasing the rights of mill-owners and others, where the mill-dams or other obstructions injuriously affect the drainage of the district comprised within the area defined; inquiry in each case having been previously made by the proper officer into the necessity of the purchase, and the amount to be paid.”

VIII.  
Condition of suburban districts of towns.

VIII. The evidence that we have received, and the reports of the Commissioners, who have visited the several towns, are uniform in their representations of the lamentable condition in which the suburban districts, and sometimes even the more crowded parts of large towns, are generally found from the presence of open pools and ditches of stagnant water. Patches of land, which the gradual encroachments of buildings have rendered useless for the purposes of cultivation, frequently lie unoccupied, and become receptacles for refuse of the most offensive description. If the soil be of a retentive nature, the evil is increased by the formation of stagnant pools, which constantly load the air with an excess of moisture, rendered most noxious to health by the effluvia arising from the decomposing animal and vegetable matter thrown into them. The extent of these evils at Liverpool is described by Mr. Holme.\*

The account of the condition of a part of the township of Pendleton, a suburb of Salford, affords an example of the facility, by no means unfrequent, with which such evils may be remedied by a better division of jurisdiction.†

The replies to the questions on this subject are almost

\* Replies by Mr. Holme, First Report, vol. i. p. 273.

† Many streets are unpaved, and there are many pools and lodgements of refuse and stagnant water. Near the boundary of Salford and Pendleton there is just now at least an acre of ground overflowed, rendering impassable a public footpath, and coming to the very walls of many inhabited houses. Nothing would be easier than to remedy this, were there any authority capable of interference; it exists in the immediate vicinity of a sewer belonging to the town of Salford, with a short and excellent fall to the river. This pool is also described as a nuisance of 30 years' standing, and as having been often presented at the Court Leet without any effect.—*Replies by a Committee of the Inhabitants of Pendleton.*



without exception of the same character; sometimes the pools are described as merely stagnant water, not receiving any drainage into them; but more frequently they assume the form of open ditches, and receive the contents of the sewers and drains of the surrounding houses. Evils of this kind are as frequent in the vicinity of the Metropolis as in any other part of the country.

*Drainage.*

Condition of Sub-urban Districts.

These evils frequently exist as extensively in places with as in those without local Acts. The provisions contained in local Acts, enabling the Commissioners to make drains and sewers, rarely apply to ground not built upon, and frequently limit the powers to streets where a certain portion, generally one-half, of the houses of the street is built.\*

Deficiency in the provisions of local Acts for the drainage of unoccupied land.

It appears to us, therefore, that it should be incumbent upon the local authorities, and that they should be empowered and be bound to drain any unoccupied ground in towns, and to require the owner to enclose it, so as to prevent it from becoming a nuisance, and a source of injury and disease to the neighbourhood. We find that such a power has already been introduced into Acts for the improvement of the towns of Leeds† and Southampton‡. A clause in the latter Act requires the owner of the property to make the drains, under a penalty of 40s.; but as we propose that all the other drainage should be executed by the local authorities, it seems to us to be desirable that this also should be done under the same direction, although the owner, in such circumstances, should be charged with the expense.

We are led to believe that the previous proper drainage of ground, intended for the erection of buildings, would eventually tend much to the benefit of the builders, and, subsequently, of the occupiers, by rendering the foundations dry and sound, and capable of being laid in at less expense.

We cannot but view the operation of the clauses, limiting the powers under local Acts to streets where less than one-half of the buildings are complete, as offering a serious impediment to the due extension of drains. By excluding the authority of the Commissioners until half of a street is completed, houses may be standing for several years without any communication with a public sewer, and in the mean time the occupiers are compelled to have recourse to very objectionable modes of drainage. Under such a provision, the drainage cannot be made to precede the buildings, which a

Effect of excluding the power of Commissioners until streets are formed.

\* Replies by Boroughreeve and Committee of Inhabitants of Salford.

† 5 and 6 Vic., cap. 104, s. 256.

‡ 7 and 8 Vic., cap. 75, s. 269.

*Drainage.* due attention to economy, as well as to health, requires.  
*Defective powers.* When at last the sewer is made, and the drains laid in at a subsequent period, the work is executed at a considerable increase of expense, and always to the inconvenience and discomfort of the inhabitants as well as interruption to the traffic of the streets.

Strong objections are thus raised to the insertion of drains, and the word "drainage" becomes synonymous with trouble, inconvenience, and expense; and after having suffered this inconvenience, and not unfrequently the loss of trade from stoppage of the traffic, the occupier is called upon to pay a considerable sum of money, a portion only of which perhaps he is entitled to recover from his landlord, who reaps the permanent benefit.

These provisions, excluding the jurisdiction of the local authority until a large portion of the streets is completed, sometimes occur in other local improvement Acts; but they are more frequently applied to the paving than to the drainage of towns.

Defective execution of local Act at Salford.

Even such imperfect legislative provisions do, however, afford an ultimate prospect of improvement in the condition of the streets. There exists an authority which has the power eventually to compel proper attention to their drainage, if at least that authority efficiently exercises its powers.

We must express our extreme regret that the powers given by such Acts have not been always vigorously exercised. In the town of Salford, for instance, the Commissioners have power, under the 83rd section of the Act, to require "the owners or occupiers to pave, flag, drain, sough, and put into good order the streets, ways, courts, passages, and places." Yet we find it stated in the replies\* returned to us, that "as to the existing powers being efficiently exercised, the reply in reference to the past, and as regards the objects for which those powers were granted, and looking to the state of the drainage in a great number of the old as well as the new streets, must be in the negative." They further proceed to state some of the difficulties that they have experienced, chiefly on the ground of the expense, to which subject we shall presently have occasion to recur. But we are at a loss to understand how such a difficulty could have prevented their more active proceeding during the first 11 years after the passing of the Act (11 Geo. IV. c. 8), as we find by their own statement that, during that period, 47 streets only were sewered, measuring 8983 yards, being at the rate of  $4\frac{1}{4}$  streets, or 816 yards per annum,

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\* Replies by a Committee of inhabitants of Salford.



while during the last year alone, with no enlargement of their powers or alteration of their Act, they sewered, previous to the month of September, 21 streets, measuring 2630 yards, and had made arrangements for proceeding with 39 streets in the following spring.

*Drainage.*

Want of jurisdiction over streets not highways.

We have no return before us of the actual number of streets, which are thus brought under the jurisdiction of the Commissioners of Salford, as compared with the remaining streets, to enable us to show the extent of the evil in that town, but it appears that in Manchester, where the powers are equally stringent, there are no less than 450 streets in which repairs have not yet been commenced by the authority appointed for such duties, and those being, for the most part, small back streets, require the greatest attention to their cleansing and drainage.\*

At Manchester.

Since the above return was made to us, another Act of Parliament has been obtained for the town of Manchester, by authority of which the town council is enabled to require any part of a street (defined to include courts) that has been set out for building to be properly drained, paved, &c.; but this Act applies only to the town of Manchester.

Deplorable as the neglect has been with regard to streets, it sinks into insignificance when compared with the state in which we have generally found the courts, and those places not commonly considered thoroughfares. The clauses in those local Acts which contain any powers for making sewers, generally authorize their formation "in streets, lanes, ways, passages, and places." These words are generally construed as not applying to courts which are not thoroughfares. Although the property is almost universally rated for the purposes of the Acts, they are held to be private property, and not to be entitled to partake in the benefits which accrue to other portions of the town, from the expenditure of the funds raised under the local Act.

Condition of courts, alleys, and narrow streets, not thoroughfares.

Considering this construction, so universally put upon the law with regard to courts, we are not surprised that they are in so miserable a condition. Unfortunately, too, they must be the last places to benefit from any improvement in drainage. The main sewers must be constructed before the minor branches can be made to communicate with them, and where, as in many towns, there is an entire want of systematic sewerage, some time must elapse before it can be carried out in all its details.

Consequences of the exclusion of courts and alleys from the jurisdiction of the local authorities.

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\* Replies by Mr. Francis, Superintendent of Paving, &c.

*Drainage.*

At Liverpool.

In the number and undrained condition of courts, Liverpool appears to have an unhappy pre-eminence, and to surpass all other towns, bad as many of them are in this respect. Mr. Holme\* states, "There are thousands of houses and hundreds of courts in this town without a single drain of any description."

The return † made in the year 1841 to the Town Council of Liverpool, by their surveyors, shows that at that time there were 2398 courts, containing a population of 68,345 persons. In these courts, 1272 cellars were occupied by 6290 persons, and of the number of cellars occupied in streets, 2848 were described as damp, and 140 as wet. As these places were subject to no local regulations whatever, until the year 1842, ‡ their present condition cannot be a matter of surprise.

Defective provisions in the Health of the Town Act.

We may also refer to the report of Dr. Duncan, § who traces a large amount of the mortality in Liverpool to the state of these undrained courts.

Although it has been stated to us that considerable progress has been made of late years in Liverpool in the extent of main sewers laid down (more than 21 miles having been constructed since 1830, and about the same length being now projected), some time must elapse before the great arrear of works can be recovered, and the proper means afforded for the drainage of these courts. We should, however, look with greater satisfaction on the exertions which we believe are now being made by the authorities at Liverpool, if we could see that they were more impressed with the necessity of affording the means of a speedy removal of all superfluous moisture, and offensive refuse from the vicinity of the houses, and had obtained more efficient powers in the Act || lately passed for regulating the drainage of courts. In this respect the Act is seriously defective. It does not require the Health Committee to make, or empower them to compel the owners to make, any but surface drains. And we are informed that considerable numbers of houses are now in the course of erection in courts which, as respects the evils arising from the want of main and underground drainage, will be liable to become as fruitful sources of disease as the older buildings have proved. The intended salutary provisions in the Act appear to us to be accompanied with defects which are calculated to lessen the expected benefit. To some of them we

\* Replies by Mr. Holme, First Report, vol. i. p. 271.

† Report on Liverpool, Second Report, vol. i.

‡ Replies by Mr. Holme, First Report, vol. i. p. 276.

§ Report on Liverpool by Mr. Duncan, First Report, vol. i. p. 155.

|| 5 and 6 Vict. cap. 44.



shall have occasion to recur under another branch of the subject. *Drainage.*

The legislative provisions, that have been specially extended to courts at Liverpool, are now found in several late Acts for other towns. At Leeds, Rochdale, Southampton, and Manchester, the courts are placed upon the same footing in all matters of sewerage, paving, and cleansing, and are now entitled to the same care and protection, as the more public and frequented portions of the towns. Greater facilities are also afforded in all the later Acts, for making the newly laid out streets, public highways, and for bringing them under the jurisdiction of the local authorities. In the great majority of towns, however, the law still requires alteration.

It appears to us that such a principle might be most beneficially extended. We are inclined to attribute some of the existing evils, of which we have pointed out a few examples, to the operation of those laws by which powers have been granted to enable only, and not to compel, all local authorities to take new streets and all courts and alleys under their charge.

In the latter local Acts, to which we have just adverted, three\* of which were passed in the last session of Parliament, the local authorities may require the owners of property in any street (which term by those Acts is defined to include a court) "to pave, flag, level, sewer, and drain it," to their satisfaction, and in case they shall refuse or neglect, are empowered to do it themselves after notice, and to recover the cost from the owner; such streets are ever afterwards to be repaired at the public expense. And with a view to enable the Commissioners to take these proceedings, the owner is required to give two months' notice of his intention "to lay out any street, sewer, or drain, or the level thereof," specifying the situation. In the necessity and the principles of provisions, giving such a power to the local authorities to compel the drainage of all streets we fully concur, but we consider that it would be an important improvement if the work were executed by the authorities themselves, instead of being divided among several different persons. Each owner or occupier must make his separate bargain with different workmen, and although they may perform the work under the direction of a public officer, and are required to do it to his satisfaction, yet they cannot execute it either so cheaply or efficiently as it would be done by an experienced workman, acting under the

Want of jurisdiction over courts and alleys.

Modern provisions for compelling the construction of house and main drainage.

\* Rochdale, Southampton, Manchester.

*Drainage.*

Importance of placing the house and main drainage under one management.

constant supervision and control of a responsible and competent officer.

The universal deficiency of main drains and sewers has hitherto rendered it impossible to carry out an extensive system of minor drains for the proper conveyance of refuse from the houses. But a more frequent introduction of a system of main drains, and an improvement in the supplies of water, have facilitated the use of the minor branches, as the cheapest and most effectual mode of removing all offensive matter from the interior of dwellings. The legislature has lately granted powers to local authorities to compel them to be made.

The earliest local Act brought under our notice that contains provisions for this purpose is that for the town of Leeds, passed in the year 1842. The Acts for Rochdale and Southampton contain the same power, and they all forbid the building of any houses, until a proper drain is provided, to the satisfaction of the authority, from the intended site to a sewer, if there is one within ten yards, but if not, to some cesspool not more than that distance.

The necessity of additional supplies of water for ensuring the proper cleansing of drains.

But while we express our satisfaction with these isolated provisions, showing a great improvement in the legislative provisions relating to house drainage, we must call attention to the testimony of medical and other witnesses,\* to which we adverted in our First Report, stating the importance of a copious supply of water for the efficient action of house drains, and that "from the want of properly directed supplies of water, both house drains and sewers have been found to act only as extended cesspools." Until this want is fully supplied, the local authorities ought to exercise with discretion the powers that Parliament has vested in them, and before they put such powers into operation, should be careful to inquire into the means available for ensuring the due action of the house drains.

Power in an Act for Liverpool to prevent refuse from houses from flowing into the sewer.

We turn from these satisfactory proofs of improvement in the principles of legislation on the subject of the public health to notice a most objectionable clause in an Act relating to Liverpool, passed in the year 1842, the same year that the Act for Leeds above mentioned, containing a provision of exactly the opposite tendency, received the sanction of the legislature. The clause in question renders the owner of any house liable to a penalty of 10*l.* for permitting offensive matter to flow from a privy or water-closet into any sewers, under the jurisdiction of the Commissioners.

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\* First Report, Evidence of Dr. S. Smith, vol. i. p. 78; Dr. Arnott, p. 50; Mr. Roe, p. 171; Mr. Austin, p. 349.



The general policy that has hitherto been pursued with reference to private drains is exemplified by the clauses found in several local Acts, which appear to us to be adapted rather to prevent than to encourage their general introduction. At present, in most instances, the communication with a sewer is granted as a favour, not ceded as a right.

*Drainage.*  
House drains.

The substance of the clauses is usually as follows:—It shall be lawful to empower any person to carry a drain into any common sewer, &c., according to the plan laid down, but any person carrying a drain without consent shall be liable to a penalty. We submit that it should rather be a matter of right for the owners of houses to carry such drains into the sewers, subject of course to the regulations laid down. This latter principle seems to have been adopted in the Act for Manchester, 11 Geo. IV. c. 47.

We refer to the conclusive proofs that have been adduced from examples in the Metropolis, to show that it is necessary to make it compulsory on owners of houses to form drains in connection with the houses. No compulsory powers for this purpose exist in London. The surveyor of one of the districts of sewers, states, “that not more than one-third of the houses have communications with the sewers.”\* Other instances are mentioned, showing that in sewers lately built very few drains have been inserted. The cause of neglecting these advantages is stated by these witnesses to arise from the charges which would be incurred, not only for the expense of making the drains, but as a contribution towards the expense of making the sewer. Many of these objections may be obviated by a better distribution of the charges.

Necessity for compelling the construction of house drains.

We have received the statements of several witnesses of experience, giving instances of the defective formation of house drains, and the nuisance arising from them, where the works have been executed separately by a common bricklayer, employed by each owner or occupier, independently of any general or systematic superintendence. Instances of the operation of the present practice occur frequently in the Metropolis. Persons of experience† have stated their opinion of the necessity as well as the economy of placing the house drainage under one common management with the main drainage, as properly forming parts of one combined system.‡

\* First Report, Evidence of Mr. Roe, vol. i. p. 170.

† Mr. Roe, vol. i. p. 173.

‡ First Report, vol. ii. p. 330. Mr. Joseph Kaye, an extensive builder in the town of Huddersfield, when asked his opinion of the advantage of placing such works under the regulation of a public body, who would execute it on a large scale, replies, “I should think they might do it one-

Drainage.

The practice which appears to obtain extensively in large towns for the working men to build their own houses,\* and their general inattention to the necessity of house drains and their careful construction, are submitted as additional reasons for placing the minor branches of house drainage, (which all the testimony on the subject proves may become the source of a foul nuisance, if not executed with due efficiency,) under one and the same jurisdiction and management with the main drainage.

*Eighth  
Recommendation.*

“ We therefore recommend that the construction of sewers,  
“ branch sewers, and house drains, be intrusted to the  
“ local administrative body.”

IX.  
Review of principal enactments  
for rating.

IX. Having now stated the chief functions, which we recommend should be placed in the hands of such administrative bodies, as it may be thought fit to intrust with the local management of laws for sanitary purposes, we proceed to review the present system of rating property, and the other means adopted under the present Acts of Parliament for procuring the necessary funds to effect local improvements, and then to consider the mode of spreading the burthens more equally upon the different persons benefited.

The rates made under the provisions for that purpose are by most local Acts applicable to other objects besides drainage; paving, cleansing, and not unfrequently lighting and watching, are the duties usually associated with it.

The rates are almost invariably made on the basis of the poor-rates, and generally limited to a certain annual amount in the pound, with a power, in a few local Acts, to increase the amount, with the consent of the rate-payers. This is the case at Toxteth Park and Rochdale. At Leeds the town council have the power, with the consent of two-thirds of the body, to increase the rate for certain purposes.

Enactments for  
rating.

Under these rating clauses we find almost every possible variety of provision for exempting different descriptions of property, from the liability to contribute its share to the local burthens. The peculiarities existing in some towns may, under certain circumstances, require the introduction of provisions specially applicable to their condition; but there are certain principles of rating, which justice demands should be uniformly established, and which no local circumstances ought to vary.

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third cheaper, and certainly much better: all the little builders are quite strangers to such work.”

\* First Report, Evidence of Mr. Cubitt, vol. ii. p. 269; Mr. Austin, vol. ii, p. 350.



Lands, occupied and cultivated as farms and market gardens, are very commonly exempted, on the ground that they derive very little benefit from the operation of the Acts. At North Shields, however, they are assessed, but at a rate in the proportion of one-third less than the town property. Again, public buildings, places of worship, and schools, are frequently exempted, although they derive benefit from drainage in common with all other descriptions of house property. This is the case, among other places, at Sunderland; but in the neighbouring town of North Shields they are made the subject of a special enactment, and are required to be rated in a particular mode.

*Drainage.*  
Enactments for  
Rating.

A power to excuse on the ground of poverty, sometimes vested in the Commissioners, sometimes in the Justices, is a very common provision, and we frequently find an absolute exemption for all houses under a certain rent, and in a few cases a graduated scale of rating is adopted, increasing with the amount of annual rent. The town of Salford presents an instance of an union of the two last principles. Houses, under the rent of 6*l.*, are there exempted; and those under 7*l.* are to be rated upon one-third of the annual rent; those under 9*l.* at one-half; and those under 10*l.* at two-thirds. But in Manchester, which is virtually the same town, and up to the time of the passing of the Acts under discussion, was subject to the same body of Commissioners, the limit for exemption is 4*l.* 10*s.*; and instead of a graduated scale, a power is given to the Commissioners to remit the rates on the ground of poverty, or to compound with the landlords at not less than one-half of the rates charged; and these inconsistent provisions are contained in Acts of Parliament passed in the same session (1830). A similar discrepancy is found in the three Acts governing the different districts of Birmingham. They all contain graduated scales for rating, but no two of them agree in the proportions to be charged according to the different rentals. These latter Acts were passed at considerable intervals of time; one of them in the year 1791, and the other two in the years 1828 and 1829.

Usual exemp-  
tions in local  
Acts.

With the above exceptions, the powers given for levying the rates may be stated generally, as extending over all descriptions of house property within the limits of the respective Acts, and as including within the liability to taxation all courts and alleys. These places by the limited construction generally put upon the words of the statutes, empowering the authorities to make sewers in streets, are for the most part excluded from any benefit in the expenditure of the money.

*Drainage.*  
 Enactments for  
 Rating.

More attention seems to have been lately paid by the legislature to the justice of exempting from rates those who are not benefited by their expenditure, by prohibiting the taxation of their property, until the streets in which it is situated are lighted, paved, or sewered, as the case may be. By the Act passed in the last session of Parliament, for Southampton, separate rates are directed to be made, one for paving, and another for lighting and sewerage, but neither of them can be levied on any property not benefited, if it be lighted and not sewered, it is to be liable to only two-thirds of the rates; and if sewered only, to one-third of the rates. At Swansea a similar provision is introduced, but one entire rate only is there made. At Manchester property is not rendered liable to be rated unless a lamp is erected within 100 yards; but that condition being fulfilled, it may then be charged with a rate, which is applicable to the other purposes of the Act—drainage, cleansing, and paving.

Exemption on  
 the ground of  
 poverty.

Our attention has been especially drawn to that class of exemptions which are so frequently found in all enactments relating to rating, and have their origin in the supposed claim of the occupants, and sometimes even the owners,\* to freedom from taxation, on the ground of poverty. These are, the unconditional exemptions of houses under a certain annual rent, amounting sometimes to as much as 7*l.* per annum;—a graduated scale of rating, increasing with the rental of the property;—and a power of excusing from payment of the rates, on the ground of poverty.

This subject has been so frequently brought before the attention of the Legislature, and has so lately been treated at length, in a most elaborate Report upon Local Taxation,† drawn up under the direction of the Poor Law Commissioners, in which an alteration in the law is recommended, quite in accordance with our own views, that it is unnecessary to state our opinions upon this subject at length. That report fully establishes the conclusion, that the landlord is the person who, directly or indirectly, gains by these exemptions.‡ The same view was taken by a Select Committee of the House of Commons, who inquired into this subject in the year 1838.

The purposes to which such rates are applied appear, above all other objects of local taxation, to be most justly made a charge upon every description of house property. The occupiers benefit by the immediate improvements in their houses.

\* Acts for Swansea and Hull.

† Report on Local Taxation, 1843, p. 94.

‡ Evidence of Mr. Hawksley, First Report, vol. ii. p. 38.



The contamination of the atmosphere is diminished by the speedy removal of moisture and impurities from their vicinity, while, at the same time, the abodes are made more healthy, dry, and comfortable. The value of the landlords' property is permanently improved by the drainage, and the risk by losses of rent reduced by the increased ability of the poor to pay in consequence of their improved health. Mr. Little,\* the owner of small tenements in London, when asked, "what are the chief causes of the loss of rent?" says, "Loss of work first, then sickness and death, then frauds." He afterwards says, "Three out of five of the losses of rent that I now have are losses from the sickness of the tenants, who are working men." He adds, "I have decidedly found that rent is best paid in healthy houses." He is confirmed in this respect by Mr. Bratt,† who has similar experience as an owner of small houses.

*Drainage.*

Enactments for  
Rating.

Among other evil consequences of these exemptions are the direct inducements held out to landlords, for the construction of such an inferior description of houses that they will only obtain occupiers of a class whose poverty entitles them to the exemption. The amount of this exemption is paid to the landlord as rent, instead of to the public purse as rates, thus increasing the burthens on the other occupiers.

Great injustice also arises to the other rate-payers in the district, where land, hitherto contributing to its burthens, and not even requiring in return any outlay from the public, becomes occupied by houses of an inferior description, which not only abstract from the public purse the amount hitherto paid to it from that source, but at the same time, by the poverty of the new population, actually bring new charges upon it. We apprehend that these exemptions afford a constant argument with the local authorities for refusing to expend the money intrusted to their charge upon property that does not contribute its share to the general burthen.

Injustice of such  
exemptions to the  
other rate-  
payers.

The principle of rendering the landlord liable for the rates on certain descriptions of property has already been introduced into several local Acts. In an Act passed for the improvement of Derby,‡ in 1825, we find that the limit is placed at 20*l.*, but since that period reasons have arisen in reference to the parliamentary franchise for confining the amount to 10*l.* In two Acts for Southampton and Swansea,

\* Evidence of Mr. Little, First Report, vol. ii. p. 303.

† Evidence of Mr. Bratt, First Report, vol. ii. p. 308.

‡ 6 Geo. IV. c. 132.

*Drainage.*  
Enactments for  
Rating.

in the last Session, and in an earlier Act for Kingston-upon-Hull, the amount is fixed at the lower sum. In the two latter Acts we find clauses giving the Commissioners power to "reduce or remit the payment of any rate on account of the poverty of any owner or occupier, or any persons liable to the payment of the rate." This power of exempting the owner seems to us to be rather inconsistent with the former one, and if acted upon, will defeat its beneficial operation.

*Ninth  
commendation.*

"On these grounds we recommend that the landlords of  
"houses be rated for the purposes of the Act, when  
"the houses are let in separate apartments, or when  
"the rent is collected more frequently than once a  
"quarter, or when the yearly rent is less than 10*l.*,  
"such a deduction being made from the gross amount  
"of the rate as may be considered a fair equivalent  
"for the labour and losses incident to the collection  
"of rents on such property."

X.  
The usual mode  
of charging for  
the construction  
of branch  
drains.

X. We have previously stated, that by most local Acts the Commissioners have a power of making main sewers out of the general rate, levied upon the whole district; but we find that the minor branches are generally executed at the expense of the owners of the adjoining property, and when completed, are placed for the future under the charge of the public body: for this purpose the Commissioners are empowered to give notice to the owners or occupiers to do the necessary works; and in default of their compliance, may execute such works themselves, and may levy the expense on the owners or occupiers. We find these powers in most of the Acts to which we have so frequently adverted,\* and at Leeds and Southampton they are extended to house drains.

At Liverpool, however, no such compulsory power is given with regard to the streets either for paving or draining; but by the Health of the Town Act the Committee have the authority to compel the owners of property in courts or passages to pave and drain them, subjecting them to the exercise of an authority from which the owners of other property are exempt. The inequality of these provisions will appear more manifest, when we notice the fact, that they extend to the whole of the new borough, which includes the district of Toxteth Park. We have already stated that that district is under a separate local Act, and we find that the Commissioners are thereby empowered to contribute half the expense of paving footways in streets, so that for paving one description of property, the owners may be aided with half the expense from

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\* Manchester, Salford, Leeds, Southampton, and Rochdale.



the general fund; for another, perhaps in the adjoining street, they may be compelled to bear the whole burthen.

But this mode of compelling improvements, while it causes great dissatisfaction from the arbitrary power necessarily exercised, does not appear in practice to be well adapted to carry on the works with expedition. The Health of the Town Committee at Liverpool, in their replies sent in to us, state with reference to the courts,—

“ But under the Act for the health of the borough these are gradually improving, but at the same time slowly, as the *narrow means* of many of the proprietors, and the tenure of property in parts of the town, forbid a hasty procedure in the desired improvements.”

The character of the clauses contained in these local Acts, for recovering the expenses of works executed by the Commissioners, where the owner has made default, will readily illustrate the oppressive nature of this mode of effecting improvements. The Commissioners are empowered to levy immediately the whole expenses from the owner or occupier; and in case of refusal to pay, may proceed to recover the money by sale and distress. It is further provided, that in case the occupier pays the money, he shall be entitled to retain the amount from his rent, but he cannot be required to pay more than is due as rent. As an instance of the extent to which it is contemplated in some cases that these demands may be carried, we find a proviso in the Act for Manchester, “ That no more costs, charges, or expenses be levied in any one year from any such occupier, not being an owner, than the fair annual value of such tenement.”

In the endeavour to lessen the hardship occasioned by these charges, we find provisions introduced in a few places enabling the Commissioners to allow time for the repayment of these expenses, but with the exception of Rochdale, this period never exceeds three years. At that place the time is undefined. The Acts for Southampton and Leeds are altogether silent upon this subject.

We have felt it necessary to dwell at some length upon these various provisions, having found, in the course of our inquiries, that the amount of money required for carrying out improvements is so large, and the summary mode of levying the expenses creates so many objections, as to present most serious obstacles to their extension. We have therefore turned our attention to the best means of remedying these evils.

In the observations explanatory of the frequent inequality

#### Drainage.

Enactments for  
Levying Charges

Arbitrary clauses  
for levying the  
expenses of  
improvements.

*Drainage.*

Enactments for  
Levying Charges.

Operation of  
these clauses at  
Manchester.

and oppression arising from the operation of the clauses of the Acts recited, we have confined ourselves as much as possible to the mere legal operation of the powers thereby granted.

The hardship arising from the present mode of recovering immediately the expenses is evidenced in the statement of Mr. Wroe,\* who, as secretary of the paving and soughing Committee at Manchester, has had great experience of the operation of these clauses. The Committee of the Town Council having no authority to extend the time for payment, generally recover the money expended on sewerage and paving in about 12 months. These expenses frequently exceed the whole rent for a year. Mr. Wroe describes these immediate calls for the money as being most seriously oppressive, especially on persons solely dependent on such property, and without power to mortgage it. Artisans, who borrow money from building clubs for the erection of houses, the interest of which frequently absorbs the whole of the rent, find great difficulty in meeting the demands for these purposes.

The statements made by Mr. Alderman Hopkins,† the chairman of the same committee, further illustrates the practical difficulties that are experienced. This statement, although made with reference to Manchester, we find to be generally applicable to all towns, where similar laws are in force. He states that the committee have 10,000*l.* placed at their disposal for the paving and sewerage of those streets which are not repaired by the public; but this sum is soon sunk in a small number of streets, and from the difficulty of recovering the cost from the owners, the progress of improvement has been so slow that they have been unable to complete more than 20 or 30 streets in a year, although more than 500 streets are in a condition for enforcement of the provisions of the Act. He states that the power of extending the period of repayment had not been exercised, as the committee felt that it would soon lock up all the funds at their disposal, when their further proceedings would be arrested. He recommends that a further sum should be borrowed, perhaps 30,000*l.*, in addition, upon the security of the rates, and that they should have power to give 10 or 20 years' credit for the repayment of the expenses.

At Salford.

At Salford, the Commissioners state that, in many cases, the payment of such heavy expenses, though for a permanent improvement, is attended with so much inconvenience and hardship, that they have been obliged to allow balances,

\* Evidence of Mr. Wroe, First Report, vol. ii. p. 341.

† Evidence of Mr. Hopkins, First Report, vol. ii. p. 345.



arising from claims of this nature, to lie over for some years beyond the period limited by law. To lessen the difficulty of levying these large sums every year, they submit their opinion that loans should be made to them for these purposes, to be recovered from the owners of the properties benefited, by annual instalments in a period of 20 years.\*

Drainage.  
Levying of  
Charges.

It appears, from the above statements, that the capital for the works is generally found by the public, and that the expenses are recovered immediately, and that the owners of property, either cannot or will not in the first instance execute the improvements at their own charges.

We have already stated our views of the advantage of placing the construction of such works, under the management of a public body ; we are induced to hold the same opinion in respect to the pecuniary advantage, that it will afford facilities for raising the necessary funds, and, by distributing the repayment of the expenses over a series of years, will lighten the burthens for these permanent improvements, now charged immediately and exclusively upon the present owners.

It is obvious that such charges press with the greatest severity upon owners, who have only a life interest in the property, or a smaller interest than the fee. In the Act passed for Manchester, in the last session of Parliament, a clause is inserted, empowering tenants for life to charge their property with such a proportion of the expenses of the works, and of raising the money, “ as any competent person, appointed by the council for that purpose, shall declare to be the fair share and proportion, which ought to be charged upon the reversion and inheritance of and in such houses and grounds.” It is enacted that the interest shall be kept down by the tenant for life, but there is no provision for the annual repayment of a proportion of the debt. The clause also declares that this charge shall have priority over all other debts. The reversioner, on his accession to the property, may thus find it encumbered with the whole debt incurred for works, executed

Power in the Act  
for Manchester  
for tenants  
for life to charge  
the property  
with expenses of  
improvements.

\* The following Table is given in the Report on Large Towns in Lancashire, as an example of the mode in which the present expenses may be reduced, and the pressure of them diminished by spreading the charges over a series of years.

	Old Charge.	Reduced Charges.	Annual Addition to the Rent. at 5 per Cent. interest, and equal instalment of the principal.
House Drain {	4l. 7s. 6d. ; 30 feet at 2s. 11d. per foot.	Improved glazed pipe drains, 6d. per foot, in- cluding repairs ; total 15s.	10½d.

*Drainage.**Levying of  
Charges.*

possibly 50 or 60 years before, and which are then beginning to require a further outlay for their renewal. We submit that such a provision, although very convenient for the tenants for life, may operate most unjustly upon the interests of the reversioners. There is also the further objection to provisions of this nature, that each individual is put to the trouble, and each separate property charged with the expense of separate legal instruments for securing sums of money, which, though bearing a large proportion to the value of the property, may in each instance amount to an insignificant sum.

The justice of the principle of distributing charges incurred for the benefit of future owners has already been acknowledged by high legal authority. In delivering judgment in a case where a question arose under the provisions of the London Building Act, as to the liability of the owner of the improved ground rent to pay the expense of rebuilding a party wall, Buller, J., expressed the following opinion:—"As to the question—whether the expense can be apportioned? that does not arise here; but if anything could be found to warrant an opinion thrown out by Lord Mansfield in *Stone v. Greenwell*,\* that the parties might be liable to a rateable proportion in some cases, it would tend much to the advancement of justice. The building a party-wall is certainly a great improvement to the premises, and every person interested in the fee, and receiving a benefit, ought to contribute."†

But it is important to urge that this principle of distribution can only be safely applied generally, with precautions that will secure the execution of works of a durable and substantial character, otherwise acts of injustice and undue exactions on those who are living and present, and have the means of remonstrating, would only be avoided by incurring the danger of shifting the burthens upon reversioners or the absent. From the circumstance of so much property being held by persons having only short or transient interests, it follows as a general rule that every distribution of expenses over periods of 20 or 30 years, according to the usual duration of the work, in respect to which the distribution of charge is made, involves, in proportion to such extension of period, charges upon reversioners and absent parties.

*Tenth  
Recommendation.*

"We therefore recommend that the duty of providing  
"the funds necessary be imposed upon the local ad-  
"ministrative body; and that the cost of making the  
"main branch sewers be equitably distributed among

\* *Mich. T. 24 Geo. III. B. R.*, referred to in 3 *T. R.*, 461.

† *Sangster v. Birkhead*, 2 *Bos. and Pul.* 303.



“the owners of the properties benefited ; and that the  
 “expense of making the house drains be charged upon  
 “the owners of the houses to which the drains are  
 “attached. That the expense remain a charge upon  
 “the properties, to be levied by a special rate upon  
 “the occupiers, and recovered with interest by annual  
 “instalments within a certain number of years, unless  
 “the owners prefer to pay the cost in the first instance,  
 “and except in the cases mentioned in the Ninth  
 “Recommendation.”

*Drainage.*  
 —  
 Levying of  
 Charges.

XI. For the purpose of assisting owners in meeting the expenses cast upon them for the drainage of new houses, we propose that they should have the option of paying for the works immediately, or of allowing the cost to remain a charge upon the property for a period of years, to be repaid annually with interest. The exact period to be allowed for the repayment of this loan (for such it would be) has been the subject of various suggestions from different witnesses, varying from 20 to 30 years. All, however, have agreed in the justice of spreading the charge for permanent works over a certain period, and they uniformly state their opinions that such assistance would most materially promote the extension of improvements.

XI.  
 Powers for  
 raising money  
 on loan.

If the local administrative bodies are intrusted with the execution of these works in the manner proposed, it will be necessary that further funds should be placed at their disposal, and that they should have ample power for borrowing money, when necessary, upon security of the rates. Such powers are already given by many local Acts, but the amount is always limited, and necessarily bears a proportion to the probable exigencies of the towns with reference to their population and opulence. The money raised under these powers is generally applicable to other purposes, besides drainage and paving. Thus at Manchester authority is given to raise 150,000*l.*, but a large portion of that sum is absorbed in the capital necessary for the establishment of gas works, which are there under the sole management of the corporation. Only 13,000*l.* a-year are appropriated to improvements in draining and paving,\* and this sum is more in the character of a loan, and used as capital for the cost of the works, which is recovered every year from the owner of the properties benefited. At Leeds 100,000*l.* may be raised, but that money can be applied to other objects, such as building markets, and repairing and widening certain bridges. No portion of

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\* Evidence of Mr. Hopkins, First Report, vol. ii. p. 345.

*Drainage.*  
 Powers to borrow  
 Money.

those funds has yet been appropriated to sanatory improvements. At Liverpool the Commissioners have power to borrow only 30,000*l.*, but they are there aided with an annual contribution from the borough fund to the amount of 5500*l.* At Rochdale, where the rate for lighting is required to be made separately from that for paving and sewerage, the Commissioners have power to raise 48,500*l.*, upon the security of the former, but none on the latter rate. In other towns the amount varies considerably. At Southampton it is 25,000*l.*, at Swansea, 15,000*l.*, and at Carlisle only 500*l.* But these powers, if exercised at all, do not appear to have been often applied for the improvement of the sewerage and paving. These sums are generally secured upon the rates for the amount of which a limit is always fixed in the Acts, usually varying from 1*s.* to 2*s.* in the pound. At Leeds it is limited to 4*d.* in the pound, and at Norwich it reaches as high as 5*s.*, but these are rare exceptions. These powers are seldom accompanied with any provision for the gradual liquidation of the debts. At Manchester and Portsmouth we find clauses for this purpose, requiring that, under certain circumstances, not less than 5*l.* per cent. shall be paid off annually.

In providing for the above objects in a general Act, it will not be practicable, from the varying circumstances of each town, to fix any limit to the amount of money which the local authorities should be empowered to borrow, this should be subject to the control of the Crown.

In all such cases an inquiry should be instituted into the amount of the population and of the rateable property within the district, and a knowledge of these circumstances, coupled with the information upon the sanatory condition of the district, acquired at the same time, would show the extent of works necessary, and become the best criterion for deciding on the proper amount to be levied or borrowed.

Consolidated  
 collection of  
 Rates.

Before we pass from this subject of rating, we are desirous of calling attention to an instance of a consolidated collection of all local rates, and general taxes, which has been brought under our notice, as having been adopted with great public convenience at Hull. Besides saving much of the expense now incurred for this purpose, it appears to us to afford the means of obviating many of the objections that are raised to the frequent and uncertain periods at which such rates are collected when placed in the hands of different officers. There is scarcely a town, however small, in which a large saving might not be effected, and a better security obtained by the



employment of a person who is not engaged in trade, and who is therefore not open to the temptation of employing the money in his hands to his own private purposes. We cannot too strongly recommend this improved system of collection for general introduction, wherever circumstances may admit of its application.\*

*Paving.*

- “ We therefore recommend that some restriction be  
 “ placed on the proportionate rates in the pound to be  
 “ levied in each year, but if the local administrative  
 “ body finds that there is need for larger funds, for  
 “ the immediate execution of works for sanatory mea-  
 “ sures, than can be provided by such rates, it be  
 “ empowered to raise, by loan on security of the rates,  
 “ subject to the approval of the Crown, such sums as  
 “ may be requisite for effecting the objects in view.  
 “ We further recommend, that provision always be  
 “ made for the gradual liquidation of such debts,  
 “ within a limited number of years.”

*Eleventh  
Recommendation*

XII. The good arrangement of the surfaces of streets, and their proper inclinations for the speedy discharge of the surface-water, is a subject of considerable importance, as affecting the health and condition of the inhabitants of towns,† and deserving much more attention than has hitherto been paid to it. We have already adverted to the neglected condition of many of the streets, inhabited by the labouring classes in all large towns, from want of under-ground drainage. These evils are most seriously aggravated by the condition of the surface; this is frequently left without any pavement or harder substance for its protection than what the natural soil affords. In this condition it remains, the inequalities of the surface gradually increasing, and forming larger basins for the reception not only of the rain and refuse water, but of much of the refuse from the adjoining houses; and although the inhabitants are liable to pay rates, no local Commissioners are bound to repair the street, until it has been once put into good condition by the owner, and has been accepted by them as a public highway. If the district is under the Highway act, there is no authority to compel the owner to do this duty; and if such power is given by a local Act, the Commissioners do not always adequately enforce it.

XII.  
*Paving.*

Connexion be-  
tween Paving  
and Drainage.

\* Evidence of Mr. Fox, App. First Report, vol. ii. p. 340.

† Report on Chorlton, First Report, vol. i. p. 202. Report on Towns in Lancashire, Second Report, vol. i.

*Paving.*

Neglect in executing the powers granted by local Acts.

Few local Acts, even those of earlier date, are entirely without provisions, either enabling the Commissioners to compel the owners to pave the streets, or to do so themselves at the charge of the general rate. But we regret to have occasion for observing the very frequent instances of the neglect of these powers. The town of Wolverhampton has been under a local Act since the year 1814, by which the owners of property in new streets are required to pave them, as soon as three-fourths of the houses are completed, "in such manner as the Commissioners direct;" and in return the owners have the privilege of an exemption from rates for 10 years. Yet we are informed, on the authority of a Committee of Inhabitants, that the new streets are not paved nor laid out with proper inclinations for the discharge of surface water, and they add, that there are pools and open ditches in some of the streets. This neglected condition of the streets is attributed by them to the want of a controlling power before the houses are built. At Derby, by an Act passed in 1825, the Commissioners are empowered to pave all present and new streets; but the reply on this subject from a Committee of the Inhabitants states, that many new streets require paving and draining. We could multiply these instances by a repetition of the examples before given by us with respect to drainage. But except in places where the jurisdiction of Commissioners is excluded, as at Salford, and a few other towns, until the streets are more than half formed, there is less excuse for this neglect, the powers for this purpose being generally more stringent, and more frequently found in the local Acts; the jurisdiction of the local authorities is, however, equally excluded from the courts and alleys. The same disregard to their condition is also exhibited in respect to the paving, that we have above shown to exist with regard to the drainage.

Condition of courts and places not thoroughfares.

Combination of duties of sewerage and paving.

Exception at Bath.

In those towns which have legislative provisions for paving and draining these duties are placed under the same authority, with co-extensive jurisdictions. As the two duties combine the surface and the under-ground drainage, and require similar qualifications in the superintending officers, it appears to us to be the most convenient arrangement that could be adopted. There are, however, a few instances where separate jurisdictions for paving exist within the same town without any authority over the drainage. This is the case at Bath, where, as we have before stated, four local Acts are in force, but one only contains a power for making sewers. In the report upon that city, it is stated as an instance of the effect of such sub-



*Paving.*  

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divisions of jurisdiction, that in York-street, near the Abbey, one-half the street was paved (longitudinally) and the other half was Macadamised. These two divisions of the street were not on the same level. At Manchester we find that although the streets are formed in the first instance by the town council under the local Act, they are subsequently repaired by the surveyors of the Highway Board.

A jurisdiction is now generally given by the later local Acts over the owners of property and builders laying out new streets. They are generally required to give notice of their intention to build, and to conform, as to the levels, to the regulations laid down by the ruling authority.

We have already noticed the opinions given by Mr. Lee\* in his observations upon the operation of the Highway Act at Sheffield, that the jurisdiction of the sewers and the roads should be under the same authority, and that large districts should be formed, as was intended by the powers given in that Act, in order to enable the employment of competent officers, and prevent the inconvenience of conflicting jurisdictions. We fully concur in the soundness of these views, which are entitled to great weight, as being conclusions derived from a practical acquaintance with the operation of the present system of subdivision of districts. It is also most essential that the duties in relation to paving and drainage, that is, the surface and the under-ground drainage, should be combined and placed under one jurisdiction.

“ We therefore recommend that the whole of the paving,  
“ and the construction of the surface of all streets,  
“ courts, and alleys be placed under the management  
“ of the same authority as the drainage, and that the  
“ limits of jurisdiction for both purposes, wherever  
“ practicable, be co-extensive.

*Twelfth  
Recommendation.*

“ We also recommend that the principle above submitted  
“ in respect to the cost of making drains and sewers,  
“ and the equitable distribution of the expense, be ad-  
“ hered to in the case of laying out, levelling, and  
“ paving of streets, courts, and alleys; but for the  
“ purpose of insuring the greatest efficiency and eco-  
“ nomy in the execution of the work, it be performed  
“ by the local public officers.”

XIII. The condition of the cleansing in all the large towns visited, and the speedy removal of all refuse, that is not carried off by water, has been the subject of frequent observa-

*XIII.  
Cleansing.*


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\* Report by the Surveyor of the Highways at Sheffield. Second Report, vol. ii.

*Cleansing.*

tion in the reports of the Commissioners. The effect which a due attention to this important branch of the good government of towns may produce on the physical condition of a population is second only to sewerage.\* The generally defective state of the drainage undoubtedly increases the necessity for constant attention to this duty; unlike the two former subjects brought under notice, it is effected with a small outlay of capital, and may be executed piecemeal, each street without reference to those adjoining, while labourers, remunerated at the lowest rate of wages, are usually employed. It might have been expected that the power, with which the local authorities are invariably invested by their local Acts, had been exercised freely, as the best compensation that could be made for deficiencies in other respects. The fact is exactly the reverse of what it ought to be. This we believe to be universally the case, and in no degree confined only to the towns that have been visited; small as well as large towns are in this particular alike.

General condition  
of streets in the  
towns visited.

The reports of the visiting Commissioners, and the replies generally made under the authority of the Commissioners under local Acts, or by influential inhabitants, will show the state of the towns in this respect; and that while the public streets receive some share of attention from the scavenger, many small streets are utterly neglected, as well as the courts and alleys, which are treated as private property, and therefore out of the jurisdiction of the Commissioners. In the report on the towns in Lancashire, the arrangements for scavenging in ten of the largest towns are given in a tabular form.† This table shows that the courts and alleys are universally neglected, and in two instances only is any attention paid to the streets, not dedicated to the public, which are not considered subject to the authority of the local bodies. This return is in illustration of the evil of the present system of considering that such courts and streets are not within the province of the public scavenger. Both Dr. Duncan and Mr. Holme‡ describe the smaller streets of Liverpool also as being in a very filthy state. As an illustration of the magnitude of this evil, we may state that in Liverpool there were, in the year 1841, 2398 courts containing 68,365 persons, besides streets, not under the public charge, of which we have no return before us. All these courts, and their numerous inhabitants, are considered to be excluded from the

Conditions of  
courts and alleys.

At Liverpool.

\* Evidence of Dr. Arnott, First Report, vol. i. p. 50.

† Report on the Large Towns in Lancashire, Second Report, vol. i.

‡ First Report, vol. i. pp. 161—272.



jurisdiction of the Scavenging Committee. Since that time the number of the courts has been increasing, and we regret that we cannot find in the Health of the Town Act any provision for placing these courts under the same regulations for cleansing as the other parts of the town. An Act, passed a few days after that here alluded to (July 16, 1842), extends the jurisdiction of the Scavenging Committee over courts; but from the replies received from the authorities, dated September, 1843, it appears that courts are still considered as private property, and cleansed, if at all, only by the occupiers. The same disinclination to exercise any jurisdiction over courts is found to prevail at Leeds. The power contained in the Improvement Act in that town for bringing the courts under the jurisdiction of the Town Council, appears to be of little avail, and such places are described to be "as much neglected as ever." Nor can we see on what principle of justice the owners of these places are denied the advantage which the regulated visits of the scavenger would afford them, since they have been rendered liable to the taxation, which may at any time be imposed for putting their property into good condition.

*Cleansing.*  
Condition of the  
Courts and  
Alleys.

At Leeds.

The report, in reference to Birmingham,\* discloses a similar extent of evil. The courts in the parish of Birmingham alone are above 2000 in number, and their inhabitants exceed 50,000, besides many in the adjoining parish of Aston. The description common to many of these places shows that they stand greatly in need of regulations for their cleansing. The atmosphere, which is necessarily close and confined, is often further deteriorated by the presence of open privies, close to which there is often one or more pigsties, tubs full of hogs'-wash, and heaps of offensive manure. These courts are frequently unpaved, and the open channel for dirty water ill-defined, so that stagnant puddles are the consequence.

At Birmingham.

Similar evils prevail in all towns, varying in their intensity in proportion to the number of the courts and streets excluded from the jurisdiction of the local authority. The effect of this want of a general and systematic superintendence is well illustrated by the statement of a gentleman at Norwich, who ascribes the neglected condition of the courts to their having "three or four proprietors, who cannot agree on the point of having them kept clean."

The earliest local Acts imposed the duties of cleansing the streets upon the occupiers, usually requiring them to cleanse

Review of the  
legislative pro-  
visions.

\* Report on Birmingham, Second Report, vol. i.

*Cleansing.*

before their respective houses, and to heap up the dirt and soil in preparation for the scavengers. We find such duties prescribed in a very early Act for Liverpool (21 Geo. II. c. 24). It is thereby enacted that the occupiers shall sweep their portion of the streets at least twice a-week, on every Monday and Thursday, or oftener if required, and that the scavengers shall attend every Tuesday and Friday, "or oftener if occasion be." It appears, however, that although the provisions of this Act, positively directing the scavengers to cleanse all the streets twice a-week, were in force up to the year 1842, it was the practice to cleanse the minor streets only once a-week, and the others, where there was less traffic, when required.\*

The inconvenience of such sub-divisions of labour seems to have led to the enactments generally found in the present local Acts, by which the Commissioners are empowered to cleanse the streets, and to remove the dirt, ashes, and rubbish from any house or premises except such as shall be reserved by the occupiers for their own use; but with regard to the footways, the old principle of requiring every occupier to sweep before his door daily is generally retained in the modern Acts.

Example of the daily cleansing the streets at Edinburgh.

The economical as well as the other advantages to be derived from a well-established system of scavenging, conducted under the direction of active and intelligent officers, armed with ample powers, are exhibited in the information obtained from Mr. Alexander Ramsay,† inspector of police at Edinburgh. He shows that the daily cleansing of that city, and of its innermost courts and closes, is not unattainable on account of the heavy expense, and that the charge upon the public amounts to about 2000*l.* a-year.

At Aberdeen.

To this instance we may add that of Aberdeen, where the local Act requires the appointed scavengers to cleanse the foot-pavements and the whole of the streets, closes, courts, &c., every day, under a penalty. This work is done at a profit of

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\* Report on Liverpool, Second Report, vol. i.

† First Report, vol. ii. p. 390. Every street, court, and alley is cleansed every day, and some parts twice a-day. The expense of the cleansing department is about 12,000*l.*, and the receipts from sale of manure about 10,000*l.* a-year.

Carts taking grain and other farm produce into Edinburgh frequently return laden with this manure.

In the small town of Dalkeith, containing about 5,200 inhabitants, every street, court, and alley is regularly cleansed thoroughly every week-day, and on Saturdays twice (morning and evening); the sale of the manure produces a sufficient sum to defray the whole of the expense, and leaves a balance of about 100*l.* a-year.



600*l.* a-year to the city, and in other towns in Scotland similar examples are found.

*Cleansing.*

We are not aware of any instance of such a frequent and systematic execution of these duties in any town in England under the direction of the local authorities; but as a further and more convincing proof, if any were wanting, that such a frequent removal of the refuse can be conducted with economy, we would refer to the account given in regard to Hull. It appears that the inhabitants have there found out that they can profitably dispose of, and the farmers that they can profitably collect, with great regularity, the refuse from the houses, even in the courts and alleys which are inaccessible to carts. This is carted away without any aid on the part of the local authority. The courts and small streets are described as bearing a marked appearance of cleanliness.

Example at  
Hull.

The principle that may be deduced from the practice at Edinburgh and Aberdeen, is, that all parts of the town require cleansing every day, and the portions inhabited by the poor more frequently than those occupied by the rich. At Hull, the regular removal of the refuse is an accident, and, as far as the authorities are concerned, the poor are as much neglected as elsewhere.

The law which the legislature has made so stringent at Aberdeen, and which has been carried into execution there and at Edinburgh, may with equal advantage be applied generally to all parts of Great Britain.\*

Further economical advantages of a frequent cleansing of roads and streets by the speedy removal of the surface mud and moisture, and consequent improvement of the roads, is shown in the statement of Mr. Whitworth,† the inventor of the street-sweeping machine, which is now in successful operation at Manchester, and part of London. This machine will execute for the same price twice the work that can be performed by hand labour.

The other duties of the local authorities, with regard to cleansing, are extended by modern Acts to the removal of “the dirt, ashes, and rubbish from all houses and premises.” The occupiers are permitted to reserve them for their own use as manure, provided that “they shall not be a nuisance

Existing provisions for the removal of refuse from houses.

\* In the Report on the Towns in Lancashire (Second Report, vol. i.), will be found a statement of the expense incurred in some of those towns for this service, as compared with the cost in the towns instanced in Scotland. The advantage in favour of the latter may probably be partly attributed to the local authorities having the exclusive right to the more valuable manure from the privies.

† First Report, vol. ii. p. 392.

*Cleansing.*  
 Powers under  
 existing Acts.

to any inhabitant within the limits;" and they are liable to penalties for obstructing scavengers in the removal of such refuse as the scavengers are authorized to take away, and other persons than the appointed scavengers are forbidden, under a penalty, from carrying away any dirt, &c. This class of clauses is generally found, repeated almost verbatim, in later Acts. They would appear by implication to vest in the Commissioners the right of property in these articles, to the exclusion of the occupier, and to give them the power of entering houses to remove them, under the condition above stated.

; Clauses granting these powers appear to have been inserted at an early period, especially in the local Acts for the government of the different districts in London, and to have been gradually copied into the laws for other large towns. The convenience resulting from the certain removal of these matters without trouble or expense to the occupiers, although involving the necessity of interference with the rights of private property, has produced, on the part of the inhabitants of places where it has been in force, a ready acquiescence in the exercise of that power, and an acknowledgment of its utility. An instance of this is found in the case of Aberdeen. Before the passing of the Act for that town, great objections were raised to the enactment vesting the entire right to the dung in the Commissioners, and the commencement of this right was postponed in certain districts of the city for 15 years. That period expired in May last; but before that time many persons were glad to take advantage of this public convenience, and voluntarily admitted the scavengers to carry off the refuse from their premises.

But it must not be supposed that this power given to the local authority to deprive the occupiers of all property in such refuse can be justified on the ground that it is relieving them of a worthless article, for in the Metropolis, where these powers have been long in force, the ashes, which form the great bulk of the refuse collected, are an article of considerable trade. The contractors are in the habit of paying large sums of money to the parishes for the right to collect them, and the large\* parishes frequently make a considerable profit from the exercise of this right, which goes to the diminution of the rates, after paying the expense of cleansing (in the mode considered sufficient by them) all the streets and roads in the parish. The advantage which a public body possesses in collecting such refuse, and in disposing of it in large quan-

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\* Evidence of Mr. W. Thorn, vol. ii. p. 369.



ties, undoubtedly renders it more valuable in their hands. *Cleansing.*  
 It is, however, a matter of some surprise that a public body <sup>Powers under existing Acts.</sup>  
 should have been invested with such powers on the ground  
 that the accumulation of such matters, comparatively inoffensive,  
 might create a nuisance to the inhabitants if their  
 regular removal was not provided for, and yet the duty should  
 not have been extended to the carrying away other refuse, far  
 more noxious and injurious to health, however small the quantity  
 accumulated may be. We have not met with any local  
 Act in England or Wales giving powers to local authorities to  
 empty and cleanse privies by their own officers. By the  
 Health of Town Act at Liverpool the Health Committee have  
 power to require the owners and occupiers to cleanse and  
 keep in repair the privies in courts, but they have no authority  
 to execute it, in case of neglect, by any of their own  
 officers. Beyond the courts, no jurisdiction is given in this  
 respect at Liverpool.

The want of some general regulations for the cleansing of <sup>Want of regulation for the proper cleansing of privies.</sup>  
 privies of the poorer classes has been witnessed in every town  
 visited by the Commissioners. The filthy condition of many  
 of the courts, from the absence of the public scavenger, and  
 the neglect of the drainage and paving, is rendered still more  
 disgusting by the abominable state of the necessaries. They  
 are frequently open to view, having no protection whatever  
 from the public eye, and from the number of persons resorting  
 to them, soon become full, and not uncommonly run over.  
 In addition to the fœtid exhalations from the overflowing  
 privies, there are found in many towns open middens, or  
 cesspools, which receive the ashes, night-soil, and all other  
 refuse, both animal and vegetable, from the adjoining houses.  
 The infrequency of the scavenging has partly created the necessity  
 for these receptacles. These places are entirely open,  
 and their contents allowed to remain in a state of putrefaction,  
 until a sufficient quantity is collected in one spot to form a  
 waggon load.

We think it unnecessary to enter into further details upon  
 this topic. The information appended to this Report contains  
 ample evidence of the general want of regulations throughout  
 all towns, and the same evils resulting from it. We shall have  
 occasion presently, in speaking of the structural arrangements  
 of houses, to recur to this subject, and to show the deplorable  
 deficiencies of accommodation in this respect. The statements  
 that we shall there present will fully establish the conclusion  
 that the deficient number of privies in the poorer quarters of  
 towns, and the large number of inhabitants resorting to them,

*Cleansing.*

deprives them of any right to be considered private, and renders it absolutely necessary for the safety of the public health that some alteration should be made in the law regarding them. That they should be in the condition generally described is not surprising, when we state that in one district in Manchester there were found to be only 33 necessaries for 7095 persons, or 1 to 215 inhabitants. Throughout the whole town of Sunderland the proportion is only 1 to 76 persons. We have also met with an instance of only one necessary to 30 families; and it appears that throughout the courts in Liverpool\* the proportion is generally about 2 to 80 persons. The town of Merthyr Tydfil presents even worse instances. These are quoted as instances of the general deficiency, and not as isolated cases.

In some parts of Scotland, however, very ample powers are given for such purposes. By the local Acts for Edinburgh and Aberdeen, we find that the entire right to the refuse of all the houses, including the night-soil, is vested in the Police Commissioners; and at the latter place the right of the police is so complete, that the owner of a private pit, wishing to secure its contents for the use of his own lands, must pay a composition to the police for its reservation; and such a permission can be granted only in case the pit is quite private and secluded. The Police Commissioners are required to make and publish regulations for the removal of what is vested, as well as what is not vested in them, and to prevent its accumulation in places and quantities, or for a length of time "such as may occasion or give reasonable cause to fear consequences injurious to the health or comfort of the neighbourhood or of individuals."

It is unnecessary to quote the powers granted by Parliament to the Commissioners at Aberdeen for the purpose of showing the recognition of the principle, that it is a public duty to establish some authority for the regulation of all matters which may be injurious to health; but the objections that arise to any proposal for granting additional powers, make us anxious to show precedents of powers that have been frequently granted by Parliament, and exercised with great public advantage.

*Thirteenth  
Recommendation.*

"For these reasons we recommend that the provisions in  
 "local Acts, vesting the right to all the dust, ashes, and  
 "street refuse in the local administrative body, be  
 "made general; and that the cleansing of all privies

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\* Report on Liverpool, Second Report, vol. i.



“and cesspools at proper times, and on due notice,  
“be exclusively intrusted to it.”

*Cleansing.*

XIV.

Prevalence of  
other nuisances.

XIV. Our attention has been called to the frequent existence of other nuisances, from which great injury arises to the neighbouring population, and of which the present state of the law affords no summary means for the removal. Collections of dung, frequently kept for sale, pigsties in the most densely populated situations, the various noxious matters from manufactories, and, above all, the animal refuse that is almost invariably to be found in the vicinity of slaughter-houses, all contribute in their several degrees to increase the impurity of the atmosphere, and to lower the physical condition of the population. In addition to these causes of disease, which ought not to exist in a well-ordered town, we have the injury from the smoke of steam-engines as well as other offensive emanations from manufactories, to which we shall refer in their proper order.

In a very full report made by a Committee of the inhabitants of Sunderland, in reply to the questions issued by us, the extent of the nuisances created by the dealers in manure is strongly illustrated. It appears that there are no less than 182 public middensteads, receptacles for filth of all kinds, which are stated to constitute one of the greatest nuisances within the borough. They are generally situated in the close, narrow streets and lanes inhabited by the poorer classes, and are frequently resorted to by them. In some cases the Committee adds, “These middensteads are actually in the basement floor of a dwelling-house, the upper stories of which are occupied as bed-rooms,” &c. The contents of these middensteads are afterwards conveyed to large depôts, of which there are two in the parish, “one very lately advertised as containing 1000 tons for sale.” This belonged to the borough. It is on the Town Moor, closely adjoining to the most densely populated part of the town. We shall presently state the powers vested in the Town Council for the abatement of such nuisances.

Middensteads  
and dung-heaps.

The state of the slaughter-houses is an almost constant source of complaint. They are very rarely placed under any regulations with regard to the constant removal of the animal refuse, their proper ventilation, or a sufficient supply of water to ensure due cleanliness. The improper situations in which these places are found, sometimes even under dwelling-houses, and the effect produced upon the health of the inhabitants, is described in the Report on the towns of Lancashire.\*

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\* “Slaughter-houses are found below dwelling-houses, the smell in which was most insufferable. In many of these cases, the inhabitants looked

*Nuisances.**Slaughter-houses.*

The effluvia arising from the blood and the entrails of animals, where recently slaughtered, renders the carrying on of such business in the precincts of large towns incompatible with due sanitary regulations, even when the offal and filth is speedily and effectually removed. In scarcely one instance, however, in which shambles or slaughter-houses have come under the observation of the Commissioners, either in the Metropolis or in provincial cities and towns, have there been found in force any regulations or authoritative supervision to compel the speedy and regular removal of offal from, or the efficient cleansing of such places. They have, on the contrary, been found to be, almost without exception, centres of the diffusion of noisome influences, affecting, with more or less intensity, the immediate vicinity, deteriorating the sanitary condition of the surrounding population, commonly poor and dense, as recorded in the local reports of the Commissioners, and in a more remote degree vitiating the general atmosphere of the town, and thus becoming a nuisance to the inhabitants at large.\*

A second evil and nuisance, necessarily contingent upon the locality of slaughter-houses, however stringently supervised and regulated, in the midst of large and populous towns, is the quantity of animal ordure deposited upon the public streets and thoroughfares leading to such slaughter-houses, which, besides forming a most offensive addition to the ordinary surface-filth, excites and accelerates its decomposition. This evil is augmented in the ratio of the size of the town, and where, as in London, most of the surface filth of the streets is washed down into the sewers, the continual passage of cattle, sheep, and pigs, in the neighbourhood of the intramural slaughter houses, must materially increase the amount of that decomposing matter, the emanations of which are constantly escaping from the untrapped gully-holes to infect the atmosphere of the Metropolis. Nor ought the occasionally fatal injuries, and the constant peril of life and limb incurred by the inhabitants of large towns, the streets of which are so

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pale and sickly, and diarrhœa frequently prevailed, although absent from the courts contiguous. Yet the state of the law prevents any interference with the manner in which these slaughter-houses are conducted. True it is that aggrieved parties may indict the occupiers of the premises, but they being labouring men, can neither afford the time nor money to pursue such indictment, nor do they belong to a class aware of the pernicious effects arising from the presence of decomposing refuse. The uncertainty of the result, moreover, is alone sufficient to deter even those who have both the means and the inclination to suppress them.”—*Report on Towns in Lancashire*, Second Report, vol. i.

\* *Report on Bristol*, Second Report, vol. i.; *Derby, Norwich*, Second Report, vol. ii.



frequently traversed by goaded and over-driven cattle, to be overlooked in an enumeration of the inevitable evils of slaughter-houses, situated in the crowded parts of towns, and as strengthening the more general sanitary grounds for urging upon the Legislature the expediency of abolishing them, and of establishing properly constructed and efficiently-regulated places for slaughtering cattle in the suburbs.

Next to the nuisance of slaughter-houses, we may mention the evils arising from the practice of keeping pigs, commonly in the most confined places. The Committee at Sunderland complain that during the prevalence of the cholera in 1831, these were the spots most visited by that scourge,

Nuisances from pigsties.

The existence of similar evils are shown to be equally prevalent in other towns. There are more than 1600 pigsties within the parish of Birmingham.\* The state of the pigsties and of the dung-hills in parts of Manchester has drawn complaints from the authorities that they are not armed with sufficient power to abate them.

Evils from these causes, and from the accumulations of offensive substances, in such masses as to amount to a dangerous nuisance, attracted the general attention of the members of this Commission in the course of their investigations. In many instances the local authorities or their officers appeared to be unaware of their existence, but in a far greater number of places this knowledge was admitted, and the continuance of the evils excused on the ground of want of power to abate them. It does not appear to us that this plea is in all cases admissible.

Existing provisions for the removal of refuse from houses.

The existence of these nuisances has been the subject of frequent complaints on the part of the inhabitants in many districts, and it is with much regret that we feel it our duty to state, that the apathy and neglect exhibited by the local authorities in not duly exercising their powers, has in many instances given just grounds for such complaints. A clause in the Act for amendment of the corporations in England and Wales empowers the Town Council to frame bye-laws for the suppression of any nuisances that are not made an offence by any Act in force within the borough. The later local Acts generally contain provisions for the suppression of nuisances from the causes above described. It thus appears, that either under the general or local Acts such a power may be obtained or is possessed in every corporate borough. The bye-laws made under the provisions of the above Act must

Bye-laws under 5 & 6 Wm. IV. c. 76, s. 90.

\* Report on Birmingham, Second Report, vol. i.

*Nuisances.*  
 Summary Powers  
 for their pre-  
 vention.

be laid before one of your Majesty's Secretaries of State before they can be carried into execution. We find that bye-laws in several towns have received this sanction, and that many of them are so framed as to give very ample powers to the town councils to suppress many of the nuisances which are subjects of complaint.\* Thus at Sunderland the keeping of any collection of manure or offensive matter of any kind "in any open or uncovered place whatever, surrounded by a wall or not," so as to be a common nuisance, is made the subject of a penalty. A similar law is found at Newcastle-upon-Tyne,† and yet we have received from thence the complaints of nuisances similar to those above shown to exist at Sunderland. At Norwich a law for preventing offensive matter flowing from slaughter-houses or pig-sties seems, by the statements of the nuisances from these sources, to be disregarded. At Liverpool, besides provisions directly enacted by law, the bye-laws include a vast number of petty offences, and if properly enforced, would produce great public benefit. They contain regulations for the internal cleansing of slaughter-houses and the removal of offensive matter within them.

We apprehend that by the active exercise of summary powers many of the most frequent nuisances might be materially abated, if not totally suppressed, and the innumerable evils arising from the filthy state of the privies might be prevented in all places, where they are exposed to public view, or are in such situations as to be public nuisances.

The execution of such powers is placed in the hands of persons who are themselves not unfrequently interested parties, and are generally made the sole judges of what should be deemed a nuisance. They are seldom assisted by the services of officers appointed to bring under their notice such matters of complaint, and to proceed, if necessary, against the offenders, while the poor, ignorant of the injury that they are suffering, or perhaps dependent for their daily bread upon the owners of such nuisances, are silent. This unwillingness to become a public prosecutor is exemplified in the statement of Mr. Neal, superintendent of nuisances at Manchester, who, in speaking of the proceedings for the prevention of nuisances at the court leet, says—"That it has hitherto been found difficult to support the indictment, in consequence of the inhabitants who have complained not attending to give evidence; and that at the court leet, held in October, 1840,

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\* List of Boroughs, Supplement.

† Replies from Newcastle, Second Report, vol. ii.



14 cases of public nuisances were dismissed from want of evidence.” *Nuisances.*

If the duty of taking such proceedings were imposed on a public officer, such failure of justice could scarcely occur.

The common law remedy of proceeding by indictment for the prevention of this class of nuisances appears to be rarely resorted to. It is far too expensive and uncertain a process for any private individual to commence, but in a few towns a power is given in the local Acts to enable the authorities to pay the costs of prosecution out of the rates. Provisions to this effect are found in the Acts for Manchester, Salford, Leeds, and Rochdale; but we are not aware that they have ever been exercised. Common law remedies.

The old established power vested in the courts leet is in a few towns still resorted to, for the abatement of the minor nuisances. Mr. Neal states, that at Manchester, since the year 1840, 35 cases have been presented, and penalties have been inflicted varying from 5*l.* to 100*l.* Mr. Coulthart gives a detailed description of the various objects which have been taken cognizance of by the leet juries at Ashton-under-Lyne, as he states, with beneficial effect. The exercise of these powers, however, has in most places fallen into desuetude even where the courts continue to be held, and the infrequency of their meetings, usually once a-year, renders them ill adapted to afford an efficient remedy, by the speedy removal of any nuisance. Upon this ground, Mr. Hawksley\* describes the proceedings of these courts at Nottingham as utterly inefficient for the purpose of enforcing any regulations of a sanatory character. Inefficiency of the powers of the courts leet.

But the class of nuisances requiring most attention generally occur in the courts and alleys that are not thoroughfares. Although injury may be inflicted on a large number of inhabitants, doubts have arisen whether annoyances arising in such places can be taken cognizance of under the authority of the courts leet, as public nuisances. This is the construction put upon the law by the steward who holds the courts for the lord of the manor at Manchester.† For suppression of private nuisances.

A very different practice appears to prevail at Ashton- Different construction of the authority of leet juries at Manchester.

At Ashton-under-Lyne.

\* First Report, vol. i. p. 318.

† Report on Manchester, Second Report, vol. i. :—"In a case of public nuisance presented at the court leet held in September, 1842, the chairman made a strict inquiry as to whether or not the smell was perceivable on the public highway, as he said that court had only power to interfere in such cases as were proved to be annoyances to the public generally, and that except where existing in or adjoining to public thoroughfares, the nuisances must be remedied by action on the part of the parties aggrieved."

*Nuisances.*

under-Lyne, where leet juries amerce the owners of houses for not providing sufficient necessities, and fix the number proper to be erected.

Provisions for  
prevention of  
nuisances in  
local Acts.

The clauses\* for the prevention of nuisances now usually inserted in local Acts are scarcely calculated to reach many of the existing evils, while the enactments are sometimes clogged with provisions, which must render them practically inoperative.

Summary powers  
for their pre-  
vention.

The operation of these clauses for the prevention of nuisances tends to drive them into the closest and worst ventilated districts, where the evils are multiplied tenfold. The powers to abate them being usually limited to the vicinity of streets, they are easily placed in situations where they are beyond the jurisdiction of any authority. The evils of many of these nuisances do not consist in their publicity or unsightly appearance, but in the injury caused to the atmosphere; this will occur wherever the nuisances are situated, and the more completely they are screened from public view the greater will be the accumulations of filth. These evils cannot be prevented, unless the nuisances be absolutely forbidden.

At Southampton.

The penalty for disobedience of the order of the Commissioners is generally 5*l.* per diem during the continuance of the nuisance. It will be seen that to give the Commissioners jurisdiction to act a complaint must be made of an existing nuisance, and any inhabitant may be the complainant. But by the clause in the Act for Southampton proceedings can only be commenced on the complaint of "six inhabitants rate-payers in the vicinity thereof," and the Commissioners are not authorized even to inquire into the existence of the nuisance until such a complaint is laid before them; so that any number of persons, not rate-payers, however severely they may be suffering, are entirely deprived of the beneficial operation of this clause, unless they can get six rate-payers in the vicinity to make a complaint in their behalf. We may further observe, as an objectionable feature of the provisions for these purposes, in all the statutes now under

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\* "That if any foundry, candle-house, melting-house, melting-place, or soap-house, hereafter to be erected or made, or any slaughter-house, boiling-house for offal, hog-sty, uninclosed or uncovered yard, or place for the depositing or sifting of lime, necessary-houses, dung-heap, manure-heap, or other offensive building, place, or matter, *in or near any street*, within the limits of this Act, shall be a nuisance to any inhabitant, it shall be lawful for the Commissioners, upon complaint made by any inhabitant, to inquire into the matter of such complaint, and if the Commissioners shall consider such building, place, or matter, of which such complaint shall be made, to be a nuisance, it shall be lawful for them, by notice in writing, to order the person by or on whose behalf such nuisance is carried on, kept, or made, to discontinue or remedy the same."



review, that the Commissioners are made the sole judges of the offence; and although the penalties, if any are incurred, can only be recovered before a justice of the peace, we apprehend that, provided the proceedings are conducted with proper regularity, it is compulsory upon him to issue the necessary process for levying the penalty. The defendant has the protection of, and is entitled to, the right to an appeal to the quarter sessions against such an order of the Commissioners. We do not, however, understand what advantage arises from investing the Commissioners with such powers to the exclusion of the magistrates; the functionaries usually intrusted with the authority of punishing offences of this description. All these Acts contain other clauses, giving the magistrates power to inflict penalties for offences of exactly the like nature; viz., for permitting any offensive matter to run into any street from any manufactory, slaughter-house, or dunghill; keeping any pigs near a street or dwelling; burning any rags or offensive matter within one hundred yards of a dwelling-house, or keeping any offensive matter within that distance, so as in any of these cases to be a nuisance to any inhabitant. If the magistrates form a competent tribunal for the decision of such questions, they may, we apprehend, be safely intrusted with the power now given to the Commissioners of ordering the abatement of nuisances.

*Nuisances.*

Summary powers  
for their pre-  
vention.

By the introduction of better regulations on the subjects which we have now been noticing, it is to be hoped that the occasions for any interference of this kind will become less frequent; but as the most constant attention is required for the punctual enforcement of any laws or regulations, we are of opinion that an officer should be appointed in each town, who, in addition to other duties that may be placed under his charge, should be required to report upon any neglect on the part of the scavengers, or any infringement of rules for the prevention of nuisances, or of any other matter affecting the health of the inhabitants, and if necessary to commence proceedings in his own name, and as an informer on the part of the public, for the punishment of offenders before the magistrates. Such an officer would receive much valuable assistance in the execution of his duties, and the public would be checked in their infringement of the law, if the police were directed to report upon any breach or neglect of it. These public servants, now generally a numerous and efficient body in each large town, although the constant witnesses of such offences, are not charged with the duty of reporting

*Nuisances.*

Summary powers  
for their pre-  
vention.

them to their superiors, or any officer empowered to correct them. It has been represented to us that this duty could be most efficiently and conveniently executed by the police, without any serious addition to their labours, or increase of expense to the inhabitants.

We have given a most attentive consideration to the necessity for any further amendments of the common law and statutory provisions for the prevention of nuisances, and we are not at present prepared to recommend that any alteration should be made in the tribunals of this country; as at present constituted, for the trial of offences of this nature, or that further powers be granted to any authorities to suppress, without compensation, any nuisances for the abatement of which the legislature has not hitherto given a summary jurisdiction. It may, however, be convenient for the abatement of some of the more serious evils to empower the local administrative body to direct that legal proceedings be taken for their suppression.

The statutory provisions, such as are contained in the clauses above recited, may, however, be generally extended with great public advantage, and we are of opinion that some of them should be so far altered as to make certain acts absolutely illegal. Some local Acts, and amongst others the statute 57 Geo. III. c. 29, s. 68, for the Metropolis, forbids the keeping of pigs within 40 yards of any street or public place. Such a provision virtually prevents the keeping of these animals, as few premises are so extensive as to be beyond the reach of this enactment. It appears to us that it would be a great improvement in the law if the keeping of them were absolutely forbidden, at least within the most crowded districts of towns, the limits of which might be defined in each case.

All public middensteads, or collections of dung within towns, should also be absolutely forbidden, unless they be placed under proper regulations to ensure the speedy removal of the refuse. We think it would be advisable to place all the collections of the refuse of slaughter-houses under similar regulations, and for this purpose to render slaughter-houses subject to a system of inspection by properly authorised officers, as is already required at Rochdale and other places, as long at least as they are permitted to remain within the crowded parts of towns. In the Act for regulating buildings in the Metropolis it is provided that no new slaughter-houses shall be established within 50 feet of any dwelling-house, and those at present existing shall be removed at the end of a



certain period. It appears to us that these provisions may be most beneficially extended. *Nuisances.*

The authorities at present constituted under the local Acts for the cleansing of streets and prevention of nuisances are, we believe, with the exception only of the Metropolis and Liverpool, always the same body, as the Sewerage and Paving Commissioners. We recommend that the combined duties be still executed by them, subject to such modifications, as to extent of jurisdiction, as local circumstances may render necessary.

“ We therefore recommend that many of the more common nuisances which prevail within towns, such as large collections of dung, be declared nuisances, and be summarily abated.” *Fourteenth Recommendation.*

Next to the evils arising from defective drainage and cleansing, none appears so generally offensive, or to produce so large an amount of discomfort and expense to the inhabitants of towns generally, as that arising from the dense black smoke of manufactories.\* *XV. Nuisances from smoke.* Its influence upon health, however, is not so apparent as upon cleanliness.

Special legislative enactments have been occasionally introduced into local Acts for a long series of years past, requiring the owners of furnaces “ to use the best practicable means for preventing or counteracting the annoyance from smoke.” Notwithstanding these special provisions and the further liability of such nuisances to prosecution and indictment, the evil continues to increase, especially in districts whose rise and progress has been mainly dependent on manufacturing establishments.

In one case more particularly, the daily increasing injurious effects that arise from steam-engine boilers, the smoke may in general be greatly lessened by judicious and careful stoking, by the adoption of special arrangements, or by the use of smokeless fuel, it appears to us desirable that the attention of the Legislature should be directed to this point, and all similar cases where no peculiar chemical process is carried on. The principle of interference on this subject has already been acknowledged. The use of any but smokeless fuel is forbidden on many railroads, and it would be a great improvement if this was extended to steam-boats navigating rivers.

“ We therefore recommend that, after such a period as

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\* Evidence of Mr. Cubitt, First Report, vol. ii. p. 277; Report on Preston, First Report, vol. i. p. 94.

*Nuisances.**Fifteenth  
Recommendation.*

“ it may be deemed advisable to fix, the provisions  
 “ in local Acts for preventing the escape of dense black  
 “ from furnaces and steam-engines in towns, be made  
 “ general. We also recommend that these provisions  
 “ be applied, so far as it is practicable, to steam-boats  
 “ usually plying within the limits of any city or town  
 “ subject to the operation of such Act.”

XVI.  
 Other nuisances  
 from manufac-  
 tories.

In respect to other nuisances from manufactories, they produce too great injury to health, independently of their effect upon property, and are too difficult of control by the present state of the law, to admit of their being passed over in silence in this Report. Noxious products evolved in manufacturing operations may be dispersed by chemical and other means now well known. Too much importance has hitherto been attached to the mere influence of lofty chimneys in removing to a distance, and diluting the noxious fumes which many manufactories evolve. In themselves they in no way destroy the emanations which are conveyed into them: these are discharged as much as before into the external atmosphere, and experience has proved, that even very lofty chimneys, on which large sums have been expended, do not necessarily insure that amount of admixture with the common air which is essential to prevent the most injurious consequences on their deposition even at very considerable distances. The extent to which nauseous, acrid, and other noxious fumes from manufactories often destroy the atmosphere in numerous dwellings, and sometimes of whole streets, is abundantly explained in the Reports of the Commissioners.

We have been induced to submit a recommendation for the prevention of these sources of injury under the conviction that great evils do arise from factories, that may influence at times a whole population, while the difficulties that attend the demonstration of the fact are often so great that it is permitted to continue for years without any person being willing to undertake the expense of proving the case. The adoption, however, of the course now indicated, will enable such difficulties to be overcome, and there appears to be no good reason, if a private dwelling be made subject to inspection under circumstances affecting, or supposed to affect the public health, why manufactories, which induce such evils to a much greater extent, should not be subject to the general cognizance of the local administrative body, who should be empowered in certain cases to take the necessary legal proceedings for the abatement of such nuisances.

The same power that advances the chemistry of the arts and manufactures has multiplied the means of controlling



and destroying offensive and injurious products from chemical operations. Taking, therefore, into consideration the facilities that now exist for preventing such noxious emanations, we feel convinced that much advantage will accrue both to the manufactory and to those who dwell in its vicinity, by the right application and more careful investigation of the means, which have already been put into successful operation for abating similar evils.

*Nuisances.*  
From manu-  
factories.

“ We therefore recommend, that in cases where com-  
“ plaints shall be substantiated that the inhabitants of  
“ any house, street, or district, in towns, are injuriously  
“ affected by the noxious exhalations of any factory,  
“ power be given to the local administrative body to  
“ ascertain the cause of such exhalations, and to take  
“ legal proceedings for the abatement of the evils, in  
“ the event of such evils not being removed on due  
“ representation.”

*Sixteenth  
Recommendation.*

XVII. The importance of an ample supply of good water, accessible at a price within the reach of the poorest classes of society, and in far greater quantities than have hitherto been furnished, is a subject worthy of the greatest attention. The result of our inquiries has convinced us that much disease and many of the inconveniences under which the poorer classes labour, may be alleviated by a plentiful supply of this great necessary of life. All medical men unite in opinion of the great advantages that a better supply of water will effect in the health of the working classes.

XVII.  
Supply of  
water.

The general and great deficiency in the supplies of water, and the consequent state of filth which the abodes of the poorer classes so constantly exhibit, has, we fear, produced a very general impression, that they are not capable of appreciating the advantages and comfort either of personal or domestic cleanliness. The information derived from the investigations of the Commissioners, and the evidence obtained through other channels, has convinced us that this is a most erroneous view of the feelings and wants of those persons, and we are most desirous to correct this impression, which, if it were well founded, would form a barrier to any prospect of improvement, and would render nugatory the recommendations that we may subsequently make for facilitating increased supplies of water. The general habits of the poor, with regard to cleanliness, must not be compared with a high standard; their daily occupations, and the nature of their employments, are such as frequently render constant personal cleanliness comparatively unattainable, and unless every possible

Its general de-  
ficiency.

*Supply of  
Water.*

facility is afforded for this end, they soon become insensible to its importance. The present difficulty and the labour, after a hard day's work, of obtaining water, has a very great effect on their economy, their habits, and their health. The obstacles to the maintenance of domestic or personal cleanliness soon produce habits of personal carelessness, which rapidly lower both the moral and physical condition of a whole population.

Ready appreciation by the poor of the value of copious supplies of water.

At the same time a very satisfactory proof of the readiness of the poorer classes to pay for a more convenient and abundant supply is given by Mr. Toynbee.\* He states that his patients have warmly expressed their willingness to pay for a better supply.

An example is given by Mr. Liddle† of a considerably increased rental being obtained for some small houses in Whitechapel after a supply of water had been laid on to each of them.

Further examples of the advantages both to the owners as well as to the occupiers of houses have been found in other towns. Mr. Smith,‡ an owner of cottages at Preston, states that his tenants agreed to pay him 2*d.* a-week for a constant supply laid on to their dwellings, but that he has not charged it to them, as he found that he was sufficiently repaid by the improved demand for his houses. Mr. Ashton,§ of Hyde, gives similar testimony, and both state that a marked improvement was evident in the cleanliness as well as the health of the people. The improvement in the habits of the labouring classes observed at Nottingham after a supply was introduced into the houses is thus stated by Mr. Hawksley||: "The increase of personal cleanliness was at first very marked indeed, it was obvious in the streets. The medical men reported that the increase of cleanliness was very great in the houses, and that there was less disease." These examples, with others that might be adduced, establish the conclusion, that the physical condition of the poor would be most materially improved by an enlarged supply of water, and that they are most ready and anxious to avail themselves of the opportunity of obtaining it, even at an expense which to them must be considerable. This view is fully borne out by the experience of the visiting Commissioners, from their observation of the condition of the poorer population, in regard both to their persons and their dwellings, in towns well supplied with water, as compared with those where the quantity is limited.

The importance of a plentiful supply of water to populous

The necessity of a supply of water for drainage, and for purposes of health.

\* First Report, vol. i. p. 85.

† First Report, vol. i. p. 107.

‡ First Report, vol. ii. p. 151.

§ First Report, vol. ii. p. 99.

|| First Report, vol. ii. p. 36.



places becomes still more apparent, when, in addition to the domestic purposes for which it is necessary, we bear in mind that a copious supply is essential to a good system of drainage, as well as being indispensable for the proper prevention of fire.

*Supply of  
Water.*

The legislative provisions for regulating the supply of water to towns for the most part stand on a very different footing from those that we have already noticed in relation to drainage, paving, and cleansing. There is no general law applicable to the subject, and it does not appear to be a generally recognized principle, that it should form part of the duty of the body intrusted with the local government of a town to enforce or to provide an adequate supply of water. Unlike the other duties generally provided for in local improvement Acts, the supplying of water to the inhabitants of a town has afforded an opportunity, which enterprising persons have seized, for the investment of capital in the erection of works for its collection and distribution, not so much to provide for the wants of the population, but as a good speculation. Water has thus become an article of trade in almost every town where there is any public supply, and is generally provided for by a separate Act of Parliament. No powers have been given by any general law, enabling any body of persons to furnish a supply, as the increase of the towns gradually deprives the inhabitants of water from its natural sources, and renders them dependent on artificial means for its introduction. There is often no sufficient inducement for the establishment of a company by the prospect of a return for the capital invested, until a large demand is created, and in the mean time the community contract habits of uncleanness, engendered by the scarcity of this necessary. It is in towns thus circumstanced that we have found the worst examples of want of cleanliness in the people, and in their habitations. In all cases, and especially in the smaller towns, the difficulty in the delay and cost of obtaining an Act of Parliament forms the great obstacle to procuring a public supply.

Legislative provisions for the supply of water.

Absence of any general Provisions.

A few instances have been brought before us, where the supply of water is placed under the management of Commissioners, not being a trading company, acting either exclusively for that purpose, or intrusted with the other duties usually combined in local improvement Acts. Of the former, we find an instance at Huddersfield, and of the latter at Brecon and Halifax, and Hull. The Act for supplying the town of Brecon was passed near seventy years ago, and its powers, which were very limited in the first instance, having never been extended, are quite inadequate to the wants

Supplies of water by other than trading companies.

*Supply of  
Water.*Supplies by  
joint stock  
companies.

of the present inhabitants. Only 170 out of 1500 houses are now supplied under its provisions.

The larger towns are, however, most frequently supplied by a joint stock company generally incorporated under an Act of Parliament. The affairs of these companies are usually managed exclusively by directors, elected by the shareholders; but in a few instances, as at Leeds, and the Harrington Water Works at Liverpool, a certain number of the corporate body are united with them. At Leeds the members of the Town Council bear an equal proportion to the other directors; at Liverpool only three members of the corporation are chosen; nine are elected by the shareholders.

Powers and  
liabilities of  
water companies.

These companies having been formed by individuals anxious for a profitable investment, dispose of it only to those persons who are willing to buy it at such rates, and on such conditions, as they are pleased to impose, subject to the restrictions laid down by the Acts of Parliament. The limits as to price are, however, rarely reached, as the companies almost invariably find it their interest to charge lower rates than those defined by their Acts. Powers are granted to them to make the necessary works, usually described in the Acts, and to lay down pipes in the streets, and sometimes through certain private grounds, but no authority is given to rate any persons except the purchasers of the water. In return for these privileges, Parliament in the later Acts has imposed liabilities to fix fire-plugs in the mains for general use in case of fire, and to permit the water to be used on such occasions without charge, and to furnish on demand, upon being remunerated for it, a supply of water for domestic purposes to every dwelling-house where their pipes are laid.

Defective pro-  
visions for secur-  
ing supplies of  
water for the  
prevention of fire.

There are defects in these provisions. As they are now inserted in the Acts lately passed, for the town of Leeds (1837) and Hull (1843), they do not lay down any rule for limiting the distance at which the fire-plugs should be inserted, nor do they require that the mains should be kept constantly full of water, without which little security will be afforded against the extension of fires. At Preston, by an Act passed in the year 1832,\* the Improvement Commissioners are empowered to fix the distance, provided they be not more frequent than 100 yards. In the earlier Acts these provisions are generally wanting.

For domestic  
purposes.

The other clauses imposing duties upon the company are intended to secure a supply for domestic purposes, but they are coupled with two provisoes, which appear calculated to defeat their beneficial object. The right to demand a supply



only arises where pipes are laid, upon payment of water-dues leviable in such cases under the Act, and then only if the supply can be given without diminishing that to the existing customers. But as there is no obligation, and often no sufficient inducement for the Company to extend their pipes into the smaller streets and courts, this provision affords no security to the inhabitants of such places. Being a trading body, they naturally carry their pipes into those parts of the town where they can get the largest and best customers, and if the supply for the whole town is limited, the inhabitants of poorer districts, where water is most required for the purposes of cleanliness and health, are quite neglected, and are without any redress whatever.

*Supply of  
Water.*

Defects in the  
present system.

From the returns which we have received from the 50 towns visited, it appears that 26 only are supplied with water under the provisions of any Act of Parliament. The supply in these towns is very deficient, and in many of them is only extended to a part of the town, the poorest and most populous portions deriving little or no benefit. In some of the larger towns the proportion of the houses that receive a separate supply is extremely small. Thus at Birmingham only 8000 out of 40,000 houses are stated to be separately supplied; and, at Newcastle-upon-Tyne, it is stated that the company supply about one-twelfth only of the dwelling-houses, and that very few of those have either tanks or tubs. The committee of inhabitants, who drew up replies to our questions, do not offer any explanation of this circumstance, but they state that many complaints have been made of the quality of the water, which they ascribe to the injudicious position of the company's works. These are stated to be "situated so near the town that the water is sometimes contaminated with the discharge of the excrementitious and other matters from the common sewers."

General deficiency of domestic supply.

In other towns not supplied by any public company or under any local Act, the inhabitants sometimes have the advantage of a supply by pipes from ancient springs belonging to the corporation or some private individual; but the supplies are generally inadequate to the demands of the population, in many instances arising from the defective system of distribution. Thus, at Coventry, the springs on one side of the town, which are described as being sufficient to afford the means of giving a cheap and abundant supply, are now under lease to an individual, and only between 300 and 400 houses out of 7200 receive a supply. The Town Council is stated

Supplies by individuals.

*Supply of  
Water.*

General defi-  
ciency of the  
domestic supply.

to have a supply of water under their command; but it is let.\* At Norwich, where about one-fourth only of the houses are supplied, the water-works are in the hands of four persons under lease from the corporation. Complaints are here made of the deficiency of water, and that the poorer classes often steal the water from the pipes belonging to other estates.

Natural advan-  
tages at Bath.

These instances of deficient quantities of water do not, however, always occur where the supply is under the management of private individuals. At Longton, a town in the Pottery districts, containing 2000 houses, it appears that nearly all of them have a separate and a constant supply.† The city of Bath also affords an instance of a town generally well supplied with water, without any legislative provisions for the purpose. The facility with which water is obtained at Bath, without any expense of pumping, and requiring only the outlay necessary for its distribution, appears to have induced the landlords of the several properties to lay down pipes for the supply of their own houses; but it is stated that “none of them are protected by Act of Parliament, and are not able to extend their pipes into any neighbouring district, and thereby create a competition.”‡ About 3000 out of 8000 houses in the city are supplied by the corporation. From this a revenue is derived of about 3000*l.* a-year. The remainder of the city is supplied by seven other companies, as they are termed; but they are in fact landlords supplying their own tenants. The height of the reservoir, 157 feet above the river Avon, where the water belonging to the corporation is collected, affords the means of distributing it over the city without any expense of pumping, and giving a supply at a very low rate; but we find that the charge, considered to be very low by the authorities, is at the rate of 10*s.* a-year for 40 gallons per diem, and that it increases to 2*l.* 10*s.*, for which sum two hogsheads are allowed. At Nottingham, where the water is pumped up from the river at a heavy expense, and afterwards filtered, the charge is only 4*s.* 4*d.*, or 1*d.* per week for the same quantity; and the highest charge, for an unlimited quantity, is 10*s.* a-year. The corporation of Bath supply gratuitously six public conduits in some of the poorer districts; but from these the water can be drawn

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\* Communication from the Directors of the Poor at Coventry, Second Report, vol. ii.

† The inhabitants of this town are indebted to his Grace the Duke of Sutherland for this supply.

‡ Report on Bath, Second Report, vol. i.



during five hours only in the morning. We shall presently show that if the duty of obtaining a supply of water was vested in one body, a large quantity of water that is at present allowed to run to waste in Bath might be most beneficially applied to the use of the poor in the worst districts of this city.

*Supply of Water.*

Operation of the present system as it affects the poor.

The neighbouring city of Bristol, containing, with Clifton, 130,000 inhabitants, is not supplied with water under the provisions of any Act of Parliament, and the supply is most inadequate, probably more so than in any town of equal size in England. It is estimated that not more than 5000 persons,\* constituting the most wealthy families in Bristol and Clifton, are supplied with water by pipes laid on to their houses; the remainder are dependent on public and private wells. These are very numerous; but the water is frequently unfit for use, being tainted with the feculent matter from the cesspools, which oozes through the porous soil and intermingles with the water. The extremely filthy condition of the habitations of the poor at Bristol is attributed, by the medical men whose statements are cited in the report on that city, to the great deficiency and the difficulty of obtaining water.

Deficiency of the supply at Bristol.

The system most commonly adopted for supplying the poorer classes with water is by stand-pipes or public wells. It appears to be susceptible of great improvement, and at present in many places produces results prejudicial both to the purchaser and seller of the water. A striking instance of the injurious operation of this system is found at Newcastle-upon-Tyne. The poor there obtain water either from public fountains supplied by the water company, and paid for by the corporation, or from "sale-pants," or stand-pipes, at which the water is sold at the rate of one farthing a skeel, a vessel containing five gallons. This charge is more than four times the rate charged for a private supply to a house, and is the same sum that the water companies in some other towns† charge for 79 gallons delivered in the house, and always at command. It is estimated that 7,000,000 gallons, producing 1041*l.*, are annually sold in this manner. Of this sum, one-third (347*l.*) is paid to the persons in attendance on the pants. The mischievous operation of this system, both upon the interests of the company and the public, will be better understood when it is stated that, at the first erection of a sale-pant,

The mode of supplying the poor usually adopted by water companies.

System at Newcastle-upon-Tyne.

\* Report on Bristol, Second Report, vol. i.

† Preston, Ashton, and Nottingham.

*Supply of  
Water.*

Operation of the  
present system  
as it affects the  
poor.

Sunderland.

Quantities and  
charges for water  
supplied in dif-  
ferent towns.

and until the customers are numerous, the superintendent is paid two-thirds of the gross receipts. The eagerness to obtain water is, however, so great, that the payment has been soon reduced to one-third; and notwithstanding the cost and the difficulty of obtaining the water, it is stated that a great improvement in the condition of the neighbourhood has always followed the introduction of a sale-pant. The expense of a superintendent naturally prevents the establishment of a pant until the customers are certain to be numerous. A similar system prevails in the neighbouring town of Sunderland.

The extravagant price that the poor thus pay for water, and the barrier placed upon its more liberal use, will be better estimated by reference to the quantities consumed by the poorer classes in towns, which have the advantage of an abundant and well distributed supply. Mr. Hawksley states, that the supply at Nottingham amounts to 40 gallons to each family per diem; at Preston it is 45 gallons. And Mr. Thom, an engineer, who has had great experience in supplying water to towns in Scotland, uses the word "supply" as meaning two cubic feet, or 13 gallons per diem for every individual of the population. At this rate of consumption, the cost at Newcastle or Sunderland would amount to 2*d.* per diem for each family, or twice the amount for a day's supply that is charged at Nottingham, Preston, and Ashton-under-Lyne, for a week's consumption. But it cannot be supposed that, under such circumstances, so large a quantity of water would be consumed; the mere labour of conveying nearly 300 gallons of water a-week would alone create a sufficient obstacle to its liberal use, even if the water could be obtained gratuitously.

Objections to  
supplying the  
poor by common  
stand-pipes.

Other objections deserving of consideration have been raised against the mode of supplying the poor by common stand-pipes, whether the water is supplied gratuitously, or at the expense of the landlords—the system in practice at Leeds and other places. These objections apply with greater force when the supply is given at intermittent periods. The system of supplying water usually adopted by companies, is to turn it on to the several districts of the town at certain periods of the day, generally two or three hours three times a-week. The houses of the wealthier portions of the community are furnished with cisterns to receive and retain the water until the period of supply recurs, but among the poorer classes the expense of erecting a cistern, forming a serious addition to the cost of a small house, is dispensed with, and they are obliged to retain the water in such vessels as they happen to possess.



It is obvious that they must watch their opportunity of collecting water during the period that it is turned on, and those who are engaged in occupations from home necessarily lose their chance of getting a supply. This inconvenience is particularly felt in districts where women and children have much employment. When pipes are not laid on to each house, much labour is expended in fetching the water, and time is lost in waiting for their turns to fill their vessels. Where many persons are collected, as frequently happens, quarrelling naturally ensues for precedence, while serious injury is often inflicted upon the morals of the better portions of the population. These evils are described by Mr. Hawksley\* and Mr. Quick.† Mr. Ashton, of Hyde,‡ near Manchester, who has lately had experience of a change of system, corroborates these statements, and bears testimony to the benefit derived by an alteration from a casual supply obtained from a distance, to a constant supply to each house.

*Supply of Water.*

Operation of the present system as it affects the poor.

He also states, that the system of stand-pipes and intermittent supply is being gradually abandoned in his neighbourhood,§ and the introduction of the water into the houses of the labouring classes is proceeding voluntarily. He also gives his reason for the opinion that the waste of water is less under the system of constant supply.

The advantages of giving a constant supply introduced into all houses, so as to be available for use at any period of day or night, as adopted in several towns,|| are fully detailed in the evidence of Mr. Hawksley and Mr. Anderton. We have received information, that the directors of the company now supplying the towns of Manchester and Salford with water, have determined, with the consent of the proprietors, to apply to Parliament for an extension of their powers, to enable them to afford the inhabitants of those towns the advantage of a supply on an equally liberal scale.

Advantages of giving a constant supply of water.

The system of constant supply offers advantages for the introduction of water into all houses which are unattainable by any other mode. Receptacles which are necessary for the retention of water, if delivered at intermittent periods, under this system are not required, and the original cost of erecting tanks or cisterns in each house can thus be saved. In the

\* Evidence of Mr. Hawksley, First Report, vol. ii. p. 75.

† Evidence of Mr. Quick, vol. ii. p. 124.

‡ Evidence of Mr. Ashton, First Report, vol. ii. p. 99.

§ See also the evidence of Mr. Mylne, First Report, vol. ii. p. 103.

|| Nottingham, Preston, Ashton, Oldham, Bury, Rochdale; see also Report on Large Towns in Lancashire; Second Report, vol. i.

*Supply of Water.*

Operation of the present system as it affects the poor.

account which Mr. Smith\* gives of the improvement effected by him in laying on water to a number of cottages at Preston, he states, that he would not have incurred the expense of putting up cisterns to each house, and that the tenants could not have remunerated him for the outlay. The cost of erecting cisterns with ball-cocks would have amounted to 180*l.*,† the sum actually expended by him was only 24*l.*, or 6*s.* for each house.

The economy thus effected in the original cost of making the necessary preparations for receiving a supply of water in each house affords a strong reason for the general introduction of this mode of supply. No supply, however abundant, will effectually promote habits of cleanliness amongst a population, unless it is readily accessible at all times, without trouble.

Considerations for placing the supply of water under the management of a disinterested body. §

We now proceed to consider how this object may best be attained with the least cost to the inhabitants, and at the same time with a due regard to the interests of the existing water companies, so as not to require an additional outlay of capital without affording a sufficient prospect of a just return.

It appears to be generally admitted by witnesses‡ examined before us, who being themselves connected with existing water companies, have had every opportunity of observing the effect of the opposing interests of the companies and their customers, that a copious supply of pure water cannot be secured to the poorer classes of the community, unless the duty of providing it is placed under the management of some independent and disinterested body. It should be the duty of the local administrative body not only to secure a sufficient supply for all the inhabitants, but by contracting with or purchasing it of the water companies, to ensure its regular distribution at a fair remunerating price. The want of such an obligation is strongly exhibited in the case of Bath, to which we have already alluded. It is stated by Mr. Little,§ the agent to one of the water companies, that the surplus water from the Circus would be sufficient during seven months of the year to supply the poor inhabitants of Avon and Milk-streets, and that for want of the necessary pipes it now runs to waste under the very houses in which it is so much needed. A very small outlay would secure the useful application of this water.

\* First Report, vol. ii. p. 151.

† Mr. Anderton, First Report, vol. ii. p. 146.

‡ First Report, Evidence of Mr. Thom, vol. ii. p. 10; Mr. Wicksteed, vol. ii. p. 14; Mr. Quick, vol. ii. p. 135.

§ Report on Bath, Second Report, vol. i.



But such instances of abundance are unfortunately of rare occurrence. The supply of water is commonly too scanty at its source, or doled out with too sparing a hand to admit of any surplus. We have already shown that the system of distribution adopted at Newcastle-upon-Tyne and Sunderland deprives the poor of the full benefits of the supply at the command of the companies in those towns, and that in other towns, as at Coventry, the supply at the source is ample, but that no means are adopted to introduce it generally into all parts of the town. In all places, however, the present system of supplying and charging for water operates most prejudicially to the interests of the poor. The deficiencies in the supplies to this class of the population appear to be partly attributable to the want of a sufficient security to the water companies for a certain return, upon the capital invested in the pipes and mains for conveying water into the poorer districts. The directors of such companies naturally hesitate to carry their pipes into districts where the returns for the money expended are so precarious; and they seldom consent to supply the houses of the poor unless the landlords become responsible for the payment of the water-rates.

*Supply of  
Water.*

Defects in the  
present system.

The companies, looking only to a profitable return for the capital invested, and the higher the dividend the better for them, whether it is in the shape of interest upon the money advanced, or as a bonus to each shareholder. They can have no interest in extending their pipes except in such a manner and under such circumstances as will give to them the largest return. Every improvement involves the outlay of additional capital, and the risk of a reduction in the dividend: these considerations operate as a serious check to the extension of the supply.

In towns where no water company is at present established, the object of obtaining a better supply may, perhaps, be most conveniently accomplished by granting sufficient powers to the bodies, intrusted with the drainage and sewerage, to raise the funds requisite to construct the necessary works, or to contract with others, and to levy certain rates for that purpose. We apprehend that it would be proper to provide that such powers should only be exercised under the permission of the control vested in the Crown. We are assured\* that any facilities thus afforded for obtaining a good supply of water would be most acceptable in those towns where the population is not large enough to insure a suffi-

Means for obtaining better supplies of water where no companies are at present established.

\* Evidence of Mr. Hawksley, First Report, vol. ii. p. 88.

*Supply of  
Water.*

Establishment of  
an authority to  
provide water.

cient return to private speculators for the capital invested, coupled with the charges consequent upon obtaining a special Act of Parliament. This opinion is strengthened by our observations of the beneficial effect of the provisions of the General Lighting Act.\* The power, given by that statute, to rate the inhabitants for lighting towns, by insuring a certain demand of gas for the public lights, has induced individuals to establish gas-works, on a very small scale, for the supply of towns containing, in some instances, a population only of 2000 persons.

In large towns also we have little doubt that any legislative measure containing such provisions will be frequently adopted. But in such places the variety of interests to be considered, and the intricacy and value of the property to be purchased, and the distance that the water must often be conveyed, will frequently render a private Act necessary to aid and enlarge, whatever powers may be granted by a general law.† In large towns, moreover, there is less difficulty in forming companies, while the expense of obtaining an Act of Parliament bears a smaller proportion to the capital invested in the works.

Where water  
companies are  
established.

In those places where the supply of water is not now under the management of the local authorities, it will be necessary that power should be given for them to contract with the water companies for a sufficient supply for all purposes, public as well as private; and that in case of refusal by the Company, they should be enabled to obtain an independent supply, and to lay down the necessary pipes for its distribution.

As the natural facilities, and the expense of obtaining water in each town, necessarily vary with their local peculiarities, the terms upon which the quantities required ought to be supplied must be arranged to suit the circumstances of each case. In calculating the charge to be made for the water, the amount of capital invested in the erection of the works, the current expenses of the establishment, and other items of expenditure, must be taken into consideration, so as to afford the proprietors of the company a fair return for the money advanced by them. In estimating the quantity of water for domestic supply, we think that in all cases where an ample supply can be procured it ought not to be calculated at a less rate than 12 gallons per diem for each individual of the population. The quantity required for public purposes will vary

\* 3 and 4 Wm. IV. c. 90.

† Evidence of Mr. Hawksley, First Report, vol. ii, p. 99.



according to the situations and other peculiarities of the towns. The water necessary for flushing the sewers will diminish as the natural advantages of drainage are greater; and the quantity used for watering the streets will vary according to the materials of which they are constructed. A more abundant supply may lead to the adoption of a system of washing the dirt from the foot pavements, and other roads, which are constructed of such materials as will admit of this mode of cleansing.\*

*Supply of Water.*

Establishment of an authority to provide water.

“ With the view of insuring a sufficient supply and  
 “ proper distribution of water to all classes, we re-  
 “ commend that it be rendered imperative on the local  
 “ administrative body, charged with the management  
 “ of the sewerage and drainage, to procure a supply  
 “ of water in sufficient quantities not only for the do-  
 “ mestic wants of the inhabitants, but also for cleansing  
 “ the streets, scouring the sewers and drains, and the  
 “ extinction of fire. For this purpose we recommend  
 “ that the said body have power to contract with  
 “ companies or other parties, or make other necessary  
 “ arrangements.”

*Seventeenth Recommendation.*

XVIII. We have already explained our views of the importance of vesting in the body charged with the administration of the other local works, the duty of obtaining supplies of water for the use of the inhabitants generally, and especially of the poorer classes; but there are other economical advantages in combining under one management the works for the supply of water within the same district.

XVIII. The necessity of placing the supply of water under one management.

In the great majority of towns, at present supplied by joint stock companies, there is only one establishment for managing the supply of water. To this rule the towns of Liverpool and Nottingham form the only exceptions. We cannot, however, present these as affording examples of the beneficial operation of a system of competition at once remunerative to the companies and satisfactory to the public.

Effect of competition between water companies.

At Liverpool, the system of supply produces great complaints on the part of the consumers, while the proprietors of the two companies, who by an understanding between themselves have practically a monopoly, are receiving a large dividend on the capital originally subscribed, as appears by the statement of Mr. Holme.† On the other hand, at Not-

At Liverpool and Nottingham.

\* Evidence of Mr. Hawksley, First Report, vol. ii. p. 63; Mr. Quick, vol. ii. p. 133; Replies from Newcastle-on-Tyne, Second Report, vol. ii.

† Report on Large Towns in Lancashire, Second Report, vol. i.; Mr. Holme, First Report, vol. i. p. 278; Evidence of Mr. Aspinall, Second Report, vol. i.

*Supply of  
Water.*

Effect of compe-  
tition between  
water companies.

tingham, where the competition between the two companies is in active operation, and water is supplied on a most liberal scale, the one is receiving only an interest of 5*l.* per cent., while the other, an old established company, has been without any dividend for nearly 20 years.\* The rivalry here has improved and cheapened the supply of water at the expense of the proprietors; at Liverpool the want of a competition has enhanced the cost, and stinted the quantity to the great benefit of the shareholders and injury of the inhabitants. The rapid increase of the population of this town has afforded sufficient scope for the profitable investment of the capital of more than one company. But where the population is more limited, the demand for water supplied under the present system, tending to prohibit its liberal use amongst the poorest and most numerous classes, is scarcely sufficient to give the shareholders a fair return for the capital laid out in the works. This appears to be the condition of many of the companies at present established. But by the introduction of a better system of rating household property for these purposes masses of the population will become consumers of water, adding largely to the rental of the water companies, and probably so far increasing their dividends as to attract for the first time the attention of another company, anxious to share in such a profitable mode of investing capital. Our attention has been earnestly drawn to the waste consequent upon such a competition generally resulting in a loss to all the parties interested in the scheme, and seldom producing any benefit to the public.

The investment of a second capital, in the same field, brings with it the necessity of maintaining separate establishments, each with its own staff of officers for the superintendence and management of works, even in the same streets; and the causes of leakage of water, and other losses from wear and tear, are multiplied in the same proportion. The mains and pipes, the great source of expense, when once laid down, are irremovable, except at a further cost. By the introduction of a competition this fixed capital either becomes totally unproductive or the returns are diminished by a reduction in the number of consumers. A large portion of the capital invested is thus superfluous, and great exertions, by reduction of price and liberality of supply, must be made to obtain public patronage. The dividends of the competing companies are

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\* The Commissioners have lately been informed that arrangements are now in progress for making an application to Parliament to effect the consolidation of these two companies.



proportionably decreased, and when both probably are on the verge of ruin an arrangement is made to withdraw from the competition. The public is thus deprived of the expected advantages, and is again exposed to the high charges generally accompanying a monopoly.

*Supply of  
Water.*

Effects of competition between companies.

The operation of the existing laws in those respects is well illustrated in the evidence of Mr. Hawksley \* and Mr. Quick,† and in the memorial which has been forwarded to us from two of the Water Companies in London.‡ The former witness has furnished us with a table, showing the rate at which the expenses of the establishment, and the charges for maintaining the works of the Water Company at Nottingham, decrease in proportion to the quantity of water supplied. From this statement it appears that the cost of supplying 1000 gallons, exclusive of the interest on capital, amounts to 1-42*d.*, or little less than 1½*d.*, and with the interest on capital it is only 3*d.*; the charges, which increase with the quantity supplied (being those connected with the pumping machines), bear a proportion of one-third only, and the remaining two-thirds (comprising the salaries of officers, the general cost of the establishment, and the repairs of buildings and works) will diminish, though in different ratios, as the quantity of water supplied is increased. The same principle is exemplified even more strongly in the case of establishments for the supply of gas.§

In considering the best mode of ensuring a cheap and abundant supply of water it is most essential to bear in mind that a great waste, both in the original outlay and in the current expenses, which fall ultimately on the public, necessarily accompanies the multiplication of works and establishments. For these reasons the number of enterprises of this kind may easily be extended beyond what is either beneficial to the public or to the proprietors themselves.

At the same time the exposure to the risk of competition frequently imposes a salutary check on the conduct of the managers of Companies, and the power of creating a rival establishment affords a valuable protection against the continuance of existing, or the creation of new, monopolies.

We have, however, reason to believe that many instances occur where the want of a sufficient security against the introduction of rivals prevents the original establishment of

\* Evidence of Mr. Hawksley, First Report, vol. ii. p. 89.

† Evidence of Mr. Quick, First Report, vol. ii. p. 134.

‡ Supplement to this Report, p. 193.

§ Evidence of Mr. Hawksley, First Report, vol. ii. p. 91.

*Supply of  
Water.*

Effect of compe-  
tition between  
companies.

Want of suf-  
ficient security  
in Acts of Parlia-  
ment for due per-  
formance of the  
duties imposed.

works, or deters the adventurers from hazarding further advances of money to meet increasing demands upon them.

It becomes, therefore, a question for consideration, whether some better guarantee than now exists could not be given for insuring a fair and just return for money advanced for the establishment of Water Companies, which will, at the same time, provide a security to the public.

The Acts of Parliament at present existing rarely contain the provisions necessary for ensuring a due compliance with the obligations imposed by them, and no competent authority exists to require the fulfilment of the objects. On the other hand the Companies are not restricted in the amount of dividend to be shared, or the minimum quantity of water to be supplied. The value of the shares may be increased to any amount,\* and the price of water unduly enhanced without any means of redress. The only remedy to which the public can now have recourse is a further application to Parliament for the creation of a new and competing Company. Such an application cannot be made without a considerable expenditure of money, and if successful will probably produce a result, such as we have already pointed out.

Cases have lately occurred where even that resource has failed. The instance here alluded to is that of the two Water Companies at Liverpool. Restrictive clauses were introduced into an Act of Parliament passed in the Session of 1843, to prevent the Corporation from applying to domestic purposes the water, which it was thereby empowered to procure and supply for the extinction of fire, and other public objects.

We feel that it is a matter of some delicacy to offer any recommendations affecting the pecuniary interests, which are involved in such undertakings. In the absence of any law requiring a public body to provide a supply of water, individuals have been induced, by a just expectation of profit, to risk their money, and they are fairly entitled to the due advantages resulting from their enterprize. We apprehend, however, that it will not be difficult to afford a better protection to the public in future, and at the same time to give a due encouragement for the investment of money in water-works, so as to ensure a general improvement in the supply of water.

In an Act passed in the year 1837, for supplying water to the town of Leeds, it is provided, that the Town Council should have power to raise the necessary funds for purchasing

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\* Replies by Mr. Holme, First Report, vol. i. p. 286.



the shares after the lapse of twelve years, at a rate of 6 per cent.; a limit is, also, placed on the amount of profit. These are examples which, it appears to us, ought to be extended to all cases.

*Supply of  
Water.*

Effects of com-  
petition between  
companies.

We anticipate that the powers vested in the local administrative body (which we propose should only be exercised under the control of the Crown), by providing the means of obtaining a good supply, would prevent those complaints, now only to be remedied by threats of appealing to the Legislature for the establishment of new schemes. It would thus become the interest of the existing bodies to submit to the conditions and regulations imposed upon them: in return for which they would be entitled to claim support to prevent the intrusion of a new and competing Company. We are convinced that the existence of a satisfactory understanding between the Companies and these bodies, who may at any time become their largest customer, will mainly contribute to this object; and, by ensuring a good supply of water, will justify the exclusion of competition, without incurring the risk of establishing an injurious monopoly.

“ We therefore recommend, that where any independent  
“ body has the management of the supply of water,  
“ it be liable to comply with the demand of the local  
“ administrative body on equitable terms; and that,  
“ further, the local administrative body be empowered  
“ to purchase the interest in water-works, subject to  
“ the control of the Crown, whenever the proprietors  
“ are willing to dispose of them.”

*Eighteenth  
Recommendation.*

“ We further recommend, that on the establishment of  
“ new Companies it be made a condition, that the  
“ local administrative body be enabled to purchase the  
“ works after the lapse of a certain number of years,  
“ upon certain terms, and upon a rate of interest to  
“ be fixed; and that, with a view to economy, compe-  
“ tition between Water Companies be discouraged as  
“ far as practicable.”

XIX. The Water Companies are now generally vested with very full powers for the recovery of the rates due to them. They have the power of levying by sale and distress of the goods of the person liable, in the same manner as a landlord may distrain for rent; and they are further armed with the summary power of cutting off the supply of water, in cases of non-payment. But even these powers do not secure them from losses. In those poor districts, where the landlord is liable for the rates, the remedy by distress will be unavailing, if he does not live on the spot, and the Company can then

XIX.  
Powers for the  
recovery of water-  
rates.

*Supply of  
Water.*

Powers for the  
recovery of water-  
rates.

only secure themselves from further loss by discontinuing the supply to the houses. This power, where it is put in force, falls upon the most helpless and the poorest classes of the community. It is unnecessary for us to dwell on the prejudicial operation of this system to all parties. Besides the injury to the poor, the Company increase their loss not only of the rent, but of the capital expended in laying down the pipes, now become unserviceable. A constant expense is also incurred by the liability to parochial rates on these pipes, which, although ceasing to produce a profit, are still charged for the local burthens. These losses to the Companies could not occur if the supply for such houses were placed under the management of the local administrative body, as we have above suggested. In addition to the security for the payment of their rates, they would be certain of a large increase in the number of their consumers, as it would be the duty of the local body to ensure a supply to the inhabitants of every house.

We anticipate that the arrangements proposed for obtaining large supplies of water from the companies through the medium of the local administrative bodies, will be of great advantage to the companies. It will give them the opportunity of disposing of the water to one extensive and responsible customer, who will pay for it under one agreement, and in one gross sum. They would be saved the trouble, and consequently the expense, of making separate bargains, and levying separate rates on a large number of small consumers, in the collection of which, whether from tenants or landlords, many disputes and losses constantly occur.

*Nineteenth  
Recommendation.*

“ We therefore recommend, that as soon as pipes are laid  
“ down, and a supply of water can be afforded to the  
“ inhabitants, all dwelling-houses capable of benefiting  
“ by such supply, be rated in the same way as for  
“ sewerage, and other local purposes; and the owners  
“ of small tenements be made liable to pay the rates  
“ for water, as we have already recommended in  
“ respect to drainage.”

XX.  
Supply of water  
for public baths  
and laundries.

XX. Besides the public purposes above mentioned to which the local administrative body may apply the water placed at their disposal, we are of opinion that a very great benefit will accrue to the poorer classes, if some portion of it be appropriated for baths, and for affording other facilities for cleanliness, which the confined dwellings of the poor now prevent them from enjoying. Public attention has lately been very generally attracted to the importance of this subject. The



success of the baths and laundries erected at Liverpool,\* by the liberality of the Corporation, has stimulated private individuals in other towns to pursue this example. The proposal for the establishment of public baths at Edinburgh was first commenced by the working classes, affording a strong and a gratifying proof of their eagerness to obtain the means of greater cleanliness, and their due appreciation of its advantages.

*Supply of  
Water*  
Baths.

A power has been given in an Act for improving the township of Birkenhead†, for the Commissioners to erect baths on the land to be purchased by them for public parks.

“We, therefore, recommend that every facility be afforded  
“to furnish ample supplies of water to public baths  
“and washhouses that may be established for the use  
“the poorer classes.”

*Twentieth  
Recommendation.*

XXI. We have already adverted to the legislative enactments relating to the supply of water for the extinction of fire, and we there intimated our opinion that the Water Companies should be required, under a penalty, to keep the mains constantly full of water, and that the distances between the fire-plugs should be limited. The present general arrangements in towns, both on the part of the Water Companies in providing ample supplies of water, and on the part of the other authorities in furnishing the means for its speedy and effectual application, vary from the highest degree of efficiency to a total want of that preparation, which prudence and foresight require. At Nottingham, Preston, and Oldham, the practice of keeping the water constantly on in the mains and pipes under a high pressure, affords the opportunity of applying it rapidly on the first outbreak of fire. The constant pressure maintained at the works of the Companies enable them in most instances to throw a jet of water to the tops of houses without the aid of a fire-engine. The facilities,‡ thus given for the extinction of fire, has caused the gradual introduction of fire-plugs upon each story of large buildings; and we are assured that the efficiency and the rapidity of this mode of applying the water has, on more than one occasion, successfully prevented any extensive damage. In extensive fires this system may not supersede the necessity of using fire-engines, but we cannot too strongly recommend its adoption where circumstances afford opportunity for its application.

XXI.  
Arrangements for  
the supply of  
water for the  
prevention of  
fire.

At Nottingham,  
Preston, and  
Oldham.

At Bath new mains have lately been laid down so as to At Bath.

\* Report from Liverpool, First Report, vol. i. p. 292.

† 6 Vic., c. 13.

‡ Mr. Anderton, First Report, vol. ii. p. 146.

*Supply of  
Water.*For the pre-  
vention of fire.

supply water on this principle, but they do not extend beyond the district supplied by the corporation. Other portions of the city are left without the advantage of such protection, although their position would admit of such a mode throughout nearly the whole of the city.

The system of supply at constant pressure affords peculiar facilities for the especial protection of large and public buildings from fire; but the requisite arrangements, by inserting a sufficient number of fire-plugs, appear to be rarely made. We are of opinion that it would be an important advantage if the owners of such buildings were empowered to have inserted, at their own expense, a sufficient number of fire-plugs in the mains of the Water Companies, under proper regulations.

At Liverpool.

With the exception of Liverpool, we have not found in any town a separate supply of water introduced for the distinct purpose of protecting property from fire. The enormous destruction of property that has occurred in that town from this cause, the extent of which has been chiefly attributed to the difficulty of obtaining a sufficiency of water, compelled the authorities to seek for a better supply than could be procured from the existing Water Companies. The losses sustained at Liverpool are not, however, confined to actual destruction of property from fire, the increased charges for insurance are the source of a serious and constantly additional expense. The premium upon insurance, always high in that town, has been raised from 8s. to 35s. per cent., while the rates for similar risks in London vary from 2s. 6d. to 5s. The diminution of the losses from fire, as well as the saving in the charges for insurance, produced by the introduction of an improved supply, is also further illustrated in the evidence contained in the replies from Philadelphia and New York.\* At the latter city the reduction in the charge for insurance has been 25l. per cent. since the formation of the Croton aqueduct.

Establishment of  
fire engines and  
police.

The arrangements for the establishment of a proper service of fire engines, and the necessary accompaniment of officers and men, are, for the most part, very defective. In any but the largest towns fires are happily not sufficiently frequent to give constant and exclusive occupation for a body of firemen, but this deficiency might be in some degree amended, if a portion of the police were regularly trained to undertake this duty,

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\* Replies from New York and Philadelphia, First Report, vol. ii. p. 136.



under the care of an efficient superintendent. Such a body might be intrusted with the charge of all the fire-engines in the town, which, when brought under one united management, would be rendered much more efficient than they are now described to be. They are now generally the property of the fire insurance offices, the corporate bodies, or parishes, and sometimes of private individuals. The introduction of a regulation requiring the establishment of a proper number of engines placed under the care of competent men, would be a most important improvement, both in respect to security of property and in the economy of the expense of maintaining the existing separate establishments. It does not appear that any system of rewards for the discovery of fires and early arrival of the engines, similar to that adopted in the Metropolis, is generally in force. We believe that it has been found most beneficial in stimulating the exertions of firemen, and might be usefully extended.

*Supply of  
Water.*

Establishment of  
fire engines and  
police.

In many cases it appears to us, that the causes of fires are not sufficiently investigated in places where accidents from fire frequently occur, and that much valuable information would be acquired and generally diffused were the causes of all fires thoroughly investigated. No regular inquiry is now instituted to ascertain the origin of fires, unless they are attended with circumstances leading to the suspicion that they have been caused wilfully. It may therefore be worthy of consideration whether such a duty should not be imposed on some existing authority.

Inquiry into the  
causes of fires.

“ We therefore recommend, that for increasing the protection of property from fire, in all cases the supply of water in the mains be not only constant, but also at as high a pressure as circumstances will permit, and that fire-plugs be inserted in the mains at short intervals.”

*Twenty-first  
Recommendation.*

Having now submitted recommendations for the adoption of the measures that require the largest outlays for their execution, viz. the works of drainage and the supply of water, we may here conveniently state the provisions which we think will be necessary to secure the proper application of any new expenditure requisite for the achievement of the several objects in question.

Advantage of  
executing work  
by contract.

In addition to the securities for efficiency and economy on which we have already given our opinions, namely, the determination by surveys of areas for efficient works of drainage, the examination or preparation of plans of new works

*Supply of  
Water.*

Advantage of  
executing works  
by contract.

by competent engineers before any new works are undertaken, the execution and maintenance of those works by properly qualified officers,—we have to recommend as another and important security, a provision requiring that all such works should be executed by contract upon open tenders, as far as practicable.\* An additional security will be given if such works, especially those constructed for the supply of water, be maintained and kept in good repair for terms of years on contract by the parties by whom they may have been executed, whose interest would thus lead them to make good and sufficient works in the first instance.

Thus in contracts for the supply of water to houses, an eligible form of contract would be for the maintenance of a given rate of supply for a term of years, leaving to the contractor the choice of apparatus. If the contractors have a fair liberty, as to the means, and a share of the first benefits of new improvements, such improvements will be soon made and rapidly carried into execution to the public advantage. Many of the works are, however, too large for single contractors, and it appears desirable to give facilities for the execution and maintenance of such works by public companies, as lessees or contractors for terms of years, with liberty of redemption by the public upon terms previously settled. We are informed that such works would frequently be executed and maintained, and all risks undertaken, upon such terms as a guaranteed profit of 6 per cent. on the outlay. When money has been borrowed, the usual market rate of interest for such investments has hitherto been  $4\frac{1}{2}$  or 5 per cent. An addition of  $1\frac{1}{2}$  per cent., for which a company would often undertake the maintenance and execution of such work, would be cheap, as compared with the risk of mismanagement by local boards, composed of persons having no professional skill, and liable to be misled as to the materials and magnitude of the proposed works, as well as to the numbers of officers requisite to maintain them. It might be difficult to ensure that a local body should be so constituted as to give the same constant attention to economy in the expenditure of other people's money that contractors would do in the expenditure and management of their own.

XXII.  
Regulations for  
buildings.

XXII. The Legislature has hitherto sanctioned but few local Acts, containing provisions for regulating the disposition

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\* Evidence of Mr. Hawksley, First Report, vol. ii. p. 92.



of land as regards the width of streets, and the space to be allotted for houses, and restrictions are rarely placed upon the mode of constructing houses, either with a view to prevent the extension of fire, or to provide the occupants with those comforts and conveniences which are now considered necessary parts of every dwelling.

*Regulations for  
Buildings.*

Width of streets.

The extent to which the motives of self-interest may induce builders, when unrestrained by law, to construct houses upon such a defective scale, and crowded together upon such small spaces as to render them insalubrious, has now long been proved. The consequence of the absence of any general regulations relating to the width of streets, and the construction of houses is exhibited in the narrowness of many of the streets and courts in the most populous towns, where the increase of population has rendered the ground most valuable.

The most extreme examples of excessive density of population that have been brought under our notice occur at Nottingham\* and Liverpool.†

There are perhaps few towns that would not present in some limited district similar instances of a dense population crowded into narrow streets, and blind courts and alleys, but they appear to occur not only most frequently, but in the greatest proportion in towns where the increase of population has been most rapid.

An example of the want of proper regulations, to prevent the erection of houses in close and confined courts, is exhibited in Liverpool. The occupiers of houses in such places comprise the poorest classes of the population, who from various causes contribute in the greatest degree to increase the high rates of mortality, exhibited by the mortuary registers at Liverpool. But the close investigation made by Dr. Duncan† into the rates of mortality in the different districts shows, that the greatest amount of fever is found in those localities where the narrowest and worst ventilated courts are most numerous and the population most dense. In one district, one in every 10 inhabitants was, on the average of 5 years, attacked with fever. The tables contained in the report of Mr. Hawksley, on the mortality of Nottingham, exhibit similar results of the unhealthiness of a population living in closely-built and ill-ventilated districts.

The same evils arising from the confinement, and consequent

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\* Report on Nottingham, First Report, vol. i. p. 331.

† Vol. i. p. 154.

*Regulations for  
Buildings.*

Width of streets.

impurity of the air in the close courts pervade all towns ; but we have not received any return of the number of courts, or of their inhabitants from other places than Liverpool and Birmingham. At the latter place they amount to nearly 2000, and are stated to contain about 50,000 persons, bearing a larger proportion to the population than at Liverpool, but the absence of cellar dwellings at Birmingham, as well as the dry soil on which the town is situated, lessen the intensity of the evils to which the poor are there exposed.

Neglected condition of courts attributable to the absence of thoroughfares through them.

We have already described the general neglect, in regard to courts and alleys, and we are inclined to attribute this neglect, in a great degree, to the general absence of thoroughfare through them. While the exclusion of the public passengers has afforded an excuse to the local authorities for not exercising any jurisdiction over them, it has contributed to prevent the exposure of their disgracefully filthy condition. The neighbouring inhabitants, whose business might have led them to pass through them, had they been thoroughfares, would not have tolerated the continuance of the heaps of filth and ordure, now so frequently found there, injuriously affecting the atmosphere, and becoming the sources of disease to the surrounding neighbourhood.

The courts are now usually constructed with only one entrance, commonly more narrow than the passage between the rows of houses, and forming an archway under another house. The remaining space is included within houses frequently so lofty as to exclude the direct action of air or light, and some portion of it being generally occupied with privies, and not unfrequently with pigsties, the whole forms a reservoir for foul and fetid air, rarely renovated, except in highly disturbed states of the atmosphere. The proportion of courts at Liverpool, which are open at the front and back, so as to admit a free current of air through them, is shown by the report of the surveyors to be only 693 out of 2398.

Provisions in local Acts or compulsory purchase of property.

Few local Acts are now passed that do not contain clauses empowering the compulsory purchases of property especially named in the Acts, and giving facilities for the acquisition of other property, where the owners are willing to dispose of it. These powers, however, are usually confined to the improvement of the means of traffic in the main streets, and although large sums of money have been expended for these objects, no instance has come under our notice where the public money has yet been applied to the purposes now under consideration. Extensive improvements have been made at Manchester by the aid of the profits arising from the public



gas works, but hitherto the poorer districts have derived little or no benefit from the large funds at the disposal of the authorities from this source. Measures have, however, lately been taken into consideration to effect these objects, but there is reason to fear that in this as in other places, they cannot be extensively carried out without recourse to the Legislature for a power to compel the sale of the property necessary to be removed.

*Regulations for  
Buildings.*  
—  
*Width of streets.*

A power to expend the rates in the purchase of property for the above purposes should be executed only under the sanction of the control of the Crown. But even such a restricted power will afford great facilities for improvements, and will often obviate the necessity of procuring special Acts for each separate occasion.

We do not anticipate that a very rapid improvement will be effected in the most densely crowded districts by the execution of powers to be given in pursuance of the recommendation that we shall presently submit. The high value of property in such districts will frequently render the extension of thoroughfares impracticable, on such a scale as would be desirable, while at the same time great caution should be exercised, lest by the removal of large numbers of the poorer classes, equally injurious effects may be produced in other parts by the overcrowding of houses, before sufficient accommodation had been provided for the disturbed population. It will, however, frequently be practicable to effect a considerable improvement in the ventilation of close and confined courts by alterations on a small scale, and at a comparatively trifling expense. The removal of a single house or a dead wall may sometimes effect the object, and a free circulation of air admitted by erecting open iron rails in their stead.

“ We therefore recommend that, subject to proper  
“ control, the local administrative body be empowered  
“ to raise money for the purchase of property for the  
“ purpose of opening thoroughfares, and widening  
“ streets, courts, and alleys, so as to improve the ven-  
“ tilation of the densely crowded districts of towns, as  
“ well as to increase the general convenience of traffic.”

*Twenty-second  
Recommendation.*

XXIII. It will, however, be comparatively easy to prevent the recurrence of similar evils in future. Provisions for regulating the width of courts and alleys have now frequently received the sanction of Parliament, and clauses have been introduced in Acts relating to Leeds, Liverpool, Manchester, and London, limiting the width at which courts may be built. Such limitations have long since been made with reference to

XXIII.  
Provisions in  
local Acts for re-  
gulating the  
width of courts.

*Regulations for* the width of streets, where the public traffic is affected ; but  
*Buildings.* it is only lately that such regulations have been applied to  
*Width of Streets.* places that are not thoroughfares, or not adapted for the  
passage of carriages.

The clauses containing these restrictions in the Liverpool Act have been so framed, that the builders have found the means of evading their beneficial object. The Act provides "that it shall not be lawful to build any house in any court which shall not be open for the space of 15 feet at the least from the ground upwards at one end of such court." The courts have been constructed with a proper regard as to width, but in some cases by being curved and branching off in several directions, entirely prevent a free current of air from passing along them.\* The evil may be further increased by an objectionable power contained in the Act to permit the narrowing the entrance of courts by erection of privies, provided that they do not reduce the width to less than six feet, so that the air passing through this channel carries with it the putrid emanations from these buildings through the entire court. The Health Committee are fortunately intrusted with the power of preventing these evils, and have hitherto very properly exercised it. But the clauses in this Act, and in that for Leeds and Manchester, do not provide for the increase of the width of the courts in proportion to the height of the adjacent houses. It is obvious that without a restriction of this kind the erection of lofty houses will completely defeat the intention of such provisions.†

In the course of our investigations our attention has been frequently drawn to the propriety of recommending the adoption of regulations to prevent the erection of houses back to back so as to obstruct their due ventilation. We have taken every opportunity of ascertaining the opinions of practical men upon this subject, and we have endeavoured to trace any particular evil effects upon the health of inhabitants of houses so situated. The results of our inquiries do not convince us that the evils arising from such a mode of constructing houses are so marked as to call for any special enactment, and the testimony of builders, while they confirm this opinion, tends to the conclusion that means may be provided for their efficient ventilation. The mere provision that an open space shall be left at the back, as well as the front of a house,

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\* Evidence of Mr. Aspinall, Second Report, Q. 59.

† Evidence of Mr. Cubitt, First Report, vol. ii. p. 264; Mr. Hosking, Second Report, Supplement, p. 183.



affords little security for a due supply of fresh air in the interior, while the addition of another outer wall, besides enhancing the cost of the building, increases the surface exposed to the damp and cold, which readily penetrates through the scantily constructed walls of inferior houses.

*Regulations for Buildings.*

*Width of Streets.*

We are unwilling, therefore, to suggest any alterations in the law calculated to interfere with the internal structure of dwelling-houses, which we are not quite satisfied are necessary for the due security to the health of the inhabitants. However prudently any regulations may be carried into execution, they must eventually increase the expense of construction, and cause an addition to the rent.

There are, however, some respects in which regulations are urgently required to compel a certain amount of attention to the structure of houses, and to prevent the habitation of dwellings so badly constructed as to be detrimental to health.

“ With the view therefore of ensuring better external ventilation, we recommend that courts and alleys be not built of a less width than twenty feet, and that they have an opening of not less than ten feet from the ground upwards at each end ; the width of the court being in proportion to the height of the houses.”

*Twenty-third Recommendation.*

XXIV. The extent to which the practice of living in cellars prevails in some large towns has caused the enactment of local laws for their regulation. We have already adverted to the number and the miserable condition of the inhabitants of cellars, as well as of the abodes themselves in Liverpool. At Manchester the number of inhabitants of cellars is computed at 18,000. At Preston also the proportion of persons living in these abodes is high, when compared with the whole population. In those towns, however, where these abodes prevail, they present similar scenes of misery and wretchedness, and afford frequent instances of the occupation of dwellings totally unfit for the residence of human beings. Examples are given by Dr. Duncan and Mr. Holme of their want of drainage in Liverpool ; and in a range of cellars in Clitheroe, it is stated that the beds were found raised on bricks to keep them out of contact with the water.\*

XXIV. Necessity for regulations relating to the occupation of cellars as dwellings.

The causes of mortality, which the researches of Dr. Duncan have enabled him to trace to the vitiated state of the air surrounding these wretched abodes in Liverpool, apply equally to other towns.†

\* Report on Large Towns in Lancashire, Second Report, vol. i.

† See Table † on next page.

*Regulations for  
Buildings.*

Local Acts have already been passed for Liverpool, Leeds, and London, prohibiting the use of cellars as dwellings, unless they are so constructed as to provide protection against the existence of such evils as we have just pointed out.

*Twenty-fourth  
Recommendation.*

“ We recommend that such provisions be made general, and that after a limited period the use of cellars as dwellings be prohibited, unless the rooms are of certain dimensions, are provided with a fire-place and window, of sufficient size, and made to open, and have an open space in front; and that the foundations be properly drained.”

XXV.  
Deficiency in the  
number of  
privies.

XXV. We have already adverted to the lamentable deficiency found to exist in all towns, in the proper supply of necessaries for the use of the poorer classes of the population. The extent to which this defect prevails in some of the larger towns is almost inconceivable. At Nottingham\* it is stated that under the most favourable circumstances houses under a rent of 10*l.* have only about one necessary to four or five houses, and frequently the inhabitants of eight or nine houses must resort to one place. In one part of Manchester† the wants of upwards of 7000 inhabitants are supplied by 33 necessaries only; and in Ashton, Mr. Coulthart alludes to a locality where there are only two privies for 50 families. This want of privies is also described as being one of the marked characteristics of the town of Merthyr Tydvil,‡ and in parts even of the Metropolis the deficiency is equally great. The cellar dwellings are almost of necessity unfurnished with these conveniences, and the inhabitants carry out the filth to the

† TABLE showing the Rate of Sickness in Children attending certain Schools in Manchester, according to the Class of their Dwellings, from the Report on Large Towns in Lancashire.

Name of School.	Scholars living in Houses in Streets.	Scholars living in Houses in Courts.	Scholars living in Cellars.	Scholars in Houses frequently absent from Sickness.	Scholars in Courts frequently absent from Sickness.	Scholars in Cellars frequently absent from Sickness.	Per Centage of Sickness of those living in Streets.	Per Centage of Sickness of those living in Courts.	Per Centage of Sickness of those living in Cellars.
Lancasterian, Boys' . . .	564	..	56	44	..	17	7·8	..	30·7
"    Girls' . . .	119	..	9	26	..	6	13·4	..	66·6
L. Mosley Street Infant School . . . . .	80	25	13	9	4	9	11	16	69
Travis Street Infant . . .	186	6	14	14	..	6	7·5	..	42·8
St. John's Boys' . . . .	142	3	11	14	1	5	9·8	..	45·4
New Jerusalem . . . . .	184	18	12	35	13	4	19	72·2	33·3
Total . . . . .	1,275	52	15	142	18	47	11	34·6	40·8

\* First Report, vol. i. p. 313.

† Report on Large Towns in Lancashire, Second Report, vol. i.

‡ Report on Merthyr Tydvil, Second Report, vol. i.



nearest channel, without regard to the injury or nuisance that it may cause to the neighbourhood, while in many cases the doorways, passages, and pavements are defiled. Similar want of regulations prevail in all towns, and may be found in parts of the Metropolis.

*Regulations for Buildings.*

Deficiency in the number of privies.

It is unnecessary to dwell upon the extensive injury to health, decency, and morals which such defective arrangements inevitably entail. The large numbers resorting to those places deprive them of all privacy. To save the space occupied by a privy in each house, a number of them for the use of an entire population of a court are commonly crowded together in one corner, and not unfrequently placed under other dwelling-houses. This is especially the case at Nottingham,\* and in some parts of Manchester. These places being resorted to by great numbers, and under no regulations as to cleansing, are constantly in the most disgusting state of filth, and are the causes of as great injury to the health of the inhabitants in their immediate vicinity as any of the numerous influences, that we have already brought under notice.

But the injury is not alone confined to the health of the occupants; the owners of the houses also suffer great losses. Many instances occur where the walls of the adjoining houses are constantly wet with fetid fluid, which frequently affects the atmosphere of the rooms so as to render it impossible to keep food for one single night without its becoming tainted.† The walls of the houses receive considerable damage, and the foundations are completely saturated with the foul water that percolates through from the cesspools. The deterioration of property from this cause is very considerable. Added to this, a constant loss is incurred by the inability of tenants to pay their rents, from sickness, and not unfrequently from the impossibility of finding persons reduced so low in the scale of society as to occupy such abodes.

Losses experienced by the landlords.

It is difficult to form any estimate of the actual losses entailed, both upon the landlord and the tenant, by this neglect of common cleanliness and decency. There can be no doubt that it is a most false economy. It is commonly alleged that it useless to improve the houses inhabited by the poorer classes, because there are no public regulations to enforce attention to their constant cleanliness, and that in the absence of such arrangements they would soon recur to their former condition. It is moreover stated that the occupiers have not the means of remunerating the owners for the outlay.

\* First Report, vol. i. p. 316.

† Report on Large Towns in Lancashire, Second Report, vol. i.

*Regulations for Buildings.*

Readiness of the poor to appreciate improvements.

These allegations have probably been drawn from the fact of such large numbers of the poorer classes being found to exist in their present miserable abodes, where they are obliged to tolerate the scenes of filth around them, to which they become inured by habit, and continue to live among, from the difficulty of finding better residences. It is certain, that under such circumstances, better habits cannot be acquired, nor if in existence are they likely to be retained. It cannot be denied that the poorest classes would most readily appreciate any improvement which affords the means of speedily removing the present accumulations of filth from the vicinity of their houses, and which would free them from their injurious consequences. Such amelioration of their dwellings by improving their health, and enabling them to follow their employments with fewer interruptions from sickness, would also increase the means at their disposal for paying their rents, and meeting other demands upon them.

Improvements in the internal arrangement for the speedy removal of refuse.

We have already shown the economy with which the introduction of systematic regulations for the due cleansing of privies is attended, as exhibited in the cities of Edinburgh and Aberdeen. Even with the present defective structural arrangements, a greater security might be given against the existence of the present evils by increasing the number of the conveniences for the poor, and by requiring that all cesspools (as long as they are permitted to be continued) should be constructed of such materials, and in such manner, as to prevent the percolation of moisture into the adjoining soil, as well as offensive emanations. At present they are very commonly open to the air, and discharge all their effluvia in such a manner, that it must be inhaled by the inhabitants. The general introduction of sewers and drains, accompanied by a reduction in the cost of their construction, will afford the means of gradually extending to the habitations of the poorer classes a system of removing all such refuse by the application of water, at once the cheapest and most effectual method. This system, which is now rapidly extending, has already been introduced into the houses of some of the labouring classes in parts of London.\* A reduction in cost will arise from the use of more cheaply constructed drains than have

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\* The ordinary expense of cleansing cesspools is stated in the Metropolis to be 1*l.* per annum (First Report, vol. ii. p. 370). It is stated that Water Companies could construct and maintain in repair an apparatus in the nature of a water-closet or soil-pan, and house-drains for the removal of all refuse and waste water, for a rental of from 5*s.* to 6*s.* per tenement per annum, or a weekly charge of 1½*d.* per house.



hitherto usually been adopted. We have had before us specimens of earthenware-pipe drains, capable of bearing any pressure that they can in practice ever be subjected to, which appear to us to be well calculated for the construction of the smaller description of drains. If properly glazed inside, they would be impermeable, and having fewer joints than brickwork, would offer less resistance by friction to the water to be conveyed away, and be less apt to allow the escape of the foul emanations, which are a common cause of complaint with the present description of drains.

We have deemed it proper to draw attention to the economical improvements that may be effected by the application of water for the speedy and cleanly removal of refuse from the interior of houses. We must express our opinion that the present objectionable system of privies and cesspools should be superseded, whenever the more general introduction of sewers and drains, combined with a better supply of water, will permit.

A few local Acts contain clauses, empowering the authorities to compel the erection of privies. Those for Salford, Liverpool, and Leeds, have such provisions. The Acts for the two latter places were passed in 1842. At Liverpool, the powers are enforced with regard to all newly erected houses in courts, but no provision has been made for the removal of the refuse. The old system of cesspools is continued, and they are in some instances so placed that they cannot be emptied without carrying their contents through the houses. It is, however, required that they be furnished with a flue to carry off the foul air. The Act for Salford has been in force since the year 1830, but we fear that there is still a lamentable deficiency in the proper number of conveniences for the poorer classes in that town.

Legislative provisions for these purposes.

But we hesitate to propose, as a fixed rule, that such an addition shall be made to all existing houses. In the most densely crowded and narrow courts it would be impracticable to find sufficient space for them without compelling their erection in the interior of houses, an arrangement under their present defective construction scarcely desirable. We would, therefore, prefer that the local authority should be intrusted with the discretionary power of compelling their erection, where circumstances permit, and in all cases, that they should require them to be kept in decent order, and properly screened from view. In many places it would be a great accommodation were public necessities erected, provided with a suffi-

*Regulations for Buildings.* efficiency of water, and placed under special regulations for their maintenance and cleanliness.

Internal structure.

*Twenty-fifth Recommendation.*

“ We therefore recommend that the provisions above  
 “ referred to be made general, and that all new houses  
 “ be provided with proper necessities for the accom-  
 “ modation of the inmates.”

XXVI.  
 Structure of  
 buildings for  
 protection  
 against fire, and  
 for ventilation.

XXVI. In the course of our inquiries, we have collected the opinions of men in practice as builders, and especially those engaged in the erection of houses for the occupation of the labouring classes, with the view of ascertaining the effect of regulations restraining the mode of constructing houses, either for increasing their stability, or for protection from fire. The tendency of the evidence has led us to the conclusion that any general interference with the minute details of buildings for the poorer classes in the great majority of towns in England and Wales is unnecessary. The peculiar circumstances of one or two towns appear to have called for the interference of the Legislature for the correction of evils there prevalent. In addition to the Metropolis, Liverpool and Bristol are the only towns under the operation of a Building Act. They have both been passed within the last few years; sufficient time has therefore scarcely elapsed to enable us to trace with certainty the results produced by the operation of these laws. The Act for Liverpool is one of peculiar stringency, and contains clauses, regulating the size of the timbers of buildings, with many details, which have not yet been applied to any other town.

Infrequency of  
 fires in the tenements  
 of the poor.

The results of the inquiries into the number of fires among houses of the poorer classes show, that if the buildings are constructed and covered with incombustible materials, fires are not more frequent or more destructive, when they do occur in towns, where there are no legislative regulations for the building of party-walls,\* or for other securities against fire, than in the Metropolis, where such regulations have long been in force. The comparative infrequency of fires that occur in this class of tenements is ascribed partly to the rooms of the poor being rarely left unoccupied, and partly to the small quantity of firing generally in use. Out of 5774 fires that took place in the Metropolis between the years 1833—

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\* The term “ party-walls ” is generally understood among builders as meaning a wall between two houses, built for the purposes of preventing the extension of fires, more substantially than is necessary for the stability of the buildings.



1843, only 142 occurred in houses built for, and occupied by the labouring classes, and of these, six only extended to the adjoining houses. Mr. Braidwood observes that "the intensity of a fire, and the chances of its spreading, depends upon the cubical contents and the quality of the material, but that is very trifling in a house built for labourers, containing from four to six room." He states, that anything in the shape of a brick wall will prevent the extension of fire in such tenements, even a nine-inch wall, provided it goes through the roof. In this opinion that "party-walls" are unnecessary for small houses, he is confirmed by Mr. Ramsay, the surveyor for an Insurance Office, resident in Lancashire. At Liverpool, where the losses from fires have been most extensive, no fires appear to have communicated to adjacent houses from absence of party-walls. It is stated by the secretary of the Fire Police Committee, that "there are no houses without a wall separating them, but although this is generally very thin, it is sufficient to prevent the extension of fire."

*Regulations for Buildings.*

For prevention of fire.

At other places fires are comparatively so rare in the dwellings of the labouring classes, that the present risk of fire originating and extending among the houses occupied by them, does not appear, from the results of our inquiries, to be sufficiently great to require an extraordinary precaution for security against such accidents.\* After a careful consideration of the facts and opinions adduced before us, on this subject, we have arrived at the conclusion that it is not requisite to introduce into a general measure, relating chiefly to the improvement of the dwellings of the poorer classes, stringent regulations, which would necessarily increase the cost of construction, solely to provide against risks from fire, proved so rarely to occur in that description of tenements.

The proper ventilation of buildings has not, until recently, received that share of attention on the part of the public that its serious influence upon health deserves; and architects and builders rarely make any provision in buildings constructed by them for a regular supply of fresh, or the removal of vitiated air, beyond what is afforded by the windows, doors, and open chimneys. The improvements in the construction of buildings, by closing all crevices, through which, in old and ill-built houses, a large supply of fresh air was constantly admitted, have partly contributed to the necessity for more

Ventilation.

\* Evidence of Mr. Kaye, First Report, vol. ii. p. 330; Mr. Thorp, vol. ii. p. 332; Mr. Corbet, vol. ii. p. 324. These witnesses concur in opinion, that the money that would be required for a party-wall might be much more advantageously applied in laying on pipes and other conveniences for supply of water.

*Regulations for Buildings.*  
 Ventilation. systematic ventilation, while the advanced state of medical inquiry has led to a conviction of the vast evils consequent upon breathing vitiated air.

It is now well ascertained that living in such impure atmospheres as generally surround the poor in their habitations, as well as in factories and workshops,\* induces consumption, renders the constitution more prone to, and less able to resist the attacks of diseases of various kinds, especially fever, and by depressing the physical energies, causes a resort to stimulants, resulting in habits of intemperance. The application of a sufficient remedy for the serious evils arising from this cause in the interior of houses would, we are convinced, contribute largely to promote the health of the poorer classes.

Objects to be attained to secure good ventilation.

The object in devising any mode for the effectual ventilation of dwellings, is to be attained by producing so gradual a movement of the air, introduced in sufficient quantity, and at a proper temperature, that while it constantly replaces the vitiated air, and keeps up a pure supply, its ingress shall be imperceptible to the occupants of the apartments. If the movement is too sluggish, the ventilation is ineffectual,—if too rapid, the current becomes perceptible, and is complained of as offensive, and the further admission of air is certainly prevented by closing the aperture, when within control of the inmates. The poor, when badly fed and clothed, and ill-supplied with firing, are particularly sensitive to currents of air; and, ignorant of the effects of breathing an impure atmosphere, prefer the warmth of air vitiated by respiration.

Notwithstanding the apparent difficulties with which the ventilation of private dwellings is surrounded, a minute examination of the circumstances of the case has assured us that no field of improvement holds out a more promising result than that which may be anticipated in future from the more successful ventilation, even of the humblest dwellings. The progress of science has explained its nature and importance. Sanatory measures for draining and cleansing will effect at least one-half the remedy by removing those impurities that have hitherto so largely polluted the atmosphere in towns, more especially in the habitations of the poor. Less air is requisite for ventilation in proportion to its purity, and, consequently the risk of offence from currents must be diminished where adequate ventilation is provided.

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\* Evidence of Mr. Toynbee, First Report, vol. i. p. 69. *et seq.*; Dr. Guy, vol. i. p. 95.



These considerations give us great confidence, in the expectation that ventilation will be much improved in proportion as its nature and importance is better known ; more especially when plans for warming and ventilation shall be minutely studied, and incorporated in original designs, instead of being merely applied, as is too often the case at present, to buildings already constructed or designed, without reference to this important object. This is the great and paramount object that should be pressed upon the attention of architects and builders.\* If structural arrangements are provided in public buildings and private dwellings, ventilation will then attain that facility and economy of execution without which its general introduction cannot be anticipated to the extent that its importance requires. But exclusively of such systematic improvements as may justly be anticipated in new buildings, where this subject is fully considered, we have reason to look forward to additional improvement in this department. The very simple fact, that vitiated air always rises, under ordinary circumstances, shows that if two apertures be provided in every apartment, one below and another above, and valves be arranged so that they may be adjusted with facility and accuracy to the circumstances of the moment, the natural laws that regulate the movement of vitiated air will induce a perpetual change, and prevent that extreme contamination which is so often observed. Extended systematic ventilation, with all its peculiarities and powers of adaptation, can only be obtained and is only required in public buildings or other large establishments ; but it cannot be too strongly pointed out, that many just objections to ventilation, as it is at present effected, arise from the fact that the feet principally are subjected to a cold current, in ordinary apartments, while the head may be in a hot stagnant atmosphere loaded with vitiated air, and saturated with moisture, produced by the breath, by combustion from lamps and candles, and from other sources. A superior aperture, and the most moderate attention to the point selected for its introduction, will secure the admission of fresh air without the current being perceptible to the human frame, and prevent it from attaining that condition where, by long continuance in a heated atmosphere, slight movements of air become offensive.

Several plans of a very simple kind have been laid before us, both for introducing fresh and removing the vitiated air. Mr. Hosking† and Mr. Holme have recommended the intro-

\* Report on Newcastle and other Towns, Second Report, vol. ii.

† See woodcuts, post pp. 183, 184.

*Regulations for  
Buildings.**Ventilation.*

duction of an aperture at the top of every room to carry off the vitiated air by a flue passing up by the side of the chimney. This is the principle which Dr. Arnott \* considers indispensable for proper ventilation. Mr. Toynbee† has also carried this principle into successful practice by inserting into the window plates of pierced zinc for the admission of fresh air. A marked improvement has followed their introduction, which has been gratefully acknowledged by those who have benefited from it.

Although some of the witnesses have urged upon us the propriety of enforcing the introduction of a system of ventilation in private dwellings, the general balance of opinion is adverse to that view. In this conclusion we concur; and although attaching the utmost importance to the introduction of some means of purifying the air in the abodes of the poor, we cannot recommend the adoption of compulsory provisions for this purpose, which, even if capable of enforcement, must lead to an interference with the privacy of domestic life most objectionable. The application of proper principles must be the result of a more general acquaintance with the subject on the part of individuals.

*Want of ventilation in places of public resort.*

Sufficient attention has not hitherto been paid to the proper ventilation of places intended for public resort, such as churches, courts of justice, concert and assembly rooms, theatres, and places of the like description: in all cases where houses or rooms are licensed, it may be possible to make proper ventilation one of the conditions in such licence.

*Want of ventilation in schools.*

In regard also to schools, the greatest injury is experienced by the young children, whose tender age makes them especially susceptible of injury from the constant respiration of a vitiated atmosphere. The facts disclosed show the extent of inattention to this subject, especially among the private schools not connected with or supported by funds raised by any public body. At the same time they fully establish the importance of providing a sufficiency of pure air for the respiration of those children, who are subject, during the remaining periods of the day, to the depressing influences of the vitiated air in their own dwellings.‡

*Unhealthy sites of schools.*

These internal evils are greatly aggravated by the unhealthy sites of a large proportion of schools, especially of those known under the name of "dame schools." Their sites appear to be rarely chosen with proper regard to the facilities

\* Evidence, First Report, vol. i. p. 55.

† Evidence, First Report, vol. i. p. 70.

‡ Report on Large Towns in Lancashire, Second Report, vol. i.



for external ventilation, or reservation of space for the recreation of the scholars. The schools kept in private houses, however, exhibit the worst evils of this kind. They abound in all large towns,\* and are described as frequently situated in courts and dirty lanes, and surrounded by and often containing filth of every description.

*Regulations for Buildings,*

*Ventilation of schools.*

We have deemed it right to draw especial attention to this subject, which has been forcibly brought under the notice of the Commissioners in the course of their recent investigations; and it appears to us to be well worthy of consideration whether some means should not be adopted for placing the ventilation and cleansing of public schools, and especially those known by the name of dame schools, under some effective regulation. We, however, have the satisfaction of reporting, that in schools under the management of intelligent masters, a great anxiety is generally evinced for improvement in their ventilation: and we have reason to believe that they are receiving constant aid from the suggestions given by the inspectors of schools, appointed under the Board of Education of your Majesty's Privy Council. From these observations we must, however, except the dame or private schools.

“ We therefore recommend that measures be adopted for  
“ promoting a proper system of ventilation in all edi-  
“ fices for public assemblage and resort, especially  
“ those for the education of youth.”

*Twenty-sixth Recommendation.*

XXVII. But while we hesitate to recommend the introduction of any provisions for regulating by law the ventilation of private dwellings on the ground of the objections that may justly be raised to the intrusion of public officers necessary for enforcing it, we feel that there are some points on which the public safety demands the exercise of a power on the part of a public authority to compel attention to the internal condition of houses so as to prevent their continuance in such a filthy and unwholesome state as to endanger the health of the public.

XXVII.  
*On the cleansing of dwellings.*

Dr. Southwood Smith† mentions an instance which has come under his notice in the Metropolis, where no less than 10 persons were lying ill of fever at one time in the same house. It was proved that fever had prevailed there for six weeks, and had previously attacked other occupants, some of whom had died. A provision has since been introduced into the

2 and 3 Vict.  
cap. 71.

\* Report on Large Towns in Lancashire, Second Report, vol. i.; Evidence of Dr. Arnott, First Report, vol. i. p. 52; Mr. Toynbee, vol. i. p. 78; Report on Durham, Second Report, vol. ii.

† Evidence, First Report, vol. i. p. 27.

*Regulations for  
Cleansing  
Houses.*Provisions in  
local Acts.

Metropolitan Police Act, enabling a magistrate, on complaint of the parish authorities and medical officer, to order the whitewashing and cleansing of houses when in such a filthy condition as to lead to the fear that they are injurious to health. This enactment is represented as defective from the want of a power to recover the expenses from the landlord. At present the occupiers only are liable, who are frequently unable to pay even this small expense.

The communication from Mr. Ramsay\* shows the extent to which this practice has been carried out in the Metropolis of Scotland. The extreme prevalence of epidemic disorders induced the police authorities to take active measures to check their extension; and although not vested with legal authority to enter houses for the purpose, by the judicious management of their officers they have contrived, at a very small expense, to give the advantage of cleansing to a large number of poor, who now gratefully acknowledge the benefit, and readily admit the servants of the authorities employed in the work. We believe that these and other salutary powers were first exercised during the visitation of the cholera in the year 1832.

Similar powers were exercised at the same period in England with equally beneficial results. A temporary Act of Parliament empowered the Lords of the Privy Council to issue rules for enforcing sufficient cleanliness in the interior as well as the exterior of dwellings. Since this Act expired, no general laws have been in force for such purpose, and we believe that there is now no Act except that above adverted to, for regulating the police courts of the Metropolis, and the local Act for the improvement of the town of Leeds, containing any similar provisions. We have received ample testimony that such a power is much needed.

The clause in the Metropolitan Police Act does not authorize the interference of the parish authorities until after the lapse of seven days. During the prevalence of any epidemic disorder we apprehend that diseases may be most extensively spread in this time, and we have therefore proposed that the period be more limited.

*Twenty-seventh  
Recommendation.*

“ On these grounds we recommend that, on complaint  
“ of the parish medical or other authorized officer,  
“ that any house or premises are in such a filthy and  
“ unwholesome state as to endanger the health of the  
“ public, and an infectious disorder exists therein, the  
“ local administrative body have power to require the

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\* First Report, vol. ii. p. 383.



“ landlord to cleanse it properly, without delay ;  
 “ and in case of his neglect, or inability, to do so by  
 “ its own officers, and recover the expense from the  
 “ landlord.”

*Regulations for  
 Cleansing  
 Houses.*

XXVIII. The absence of all provisions for the proper regulation of common lodging-houses has been a most frequent subject of complaint in the several towns visited. They are represented invariably to be the places where many infectious disorders originate, and whence they are spread over the whole country by the numerous vagrants there exposed to the risk of infection. No provision is ever made for their ventilation, and the evils arising from its absence are largely increased by the numbers nightly crowded together, in spaces quite incompatible with decency, or with the maintenance of a healthy atmosphere. There are, however, many places occupied as lodging-houses, which from their confined situation are quite incapable of any ventilation, and are in other respects totally unfit for the abode of man.\*

XXVIII.  
 Regulations for  
 lodging-houses.

Instances occur frequently where the beds are placed in tiers one above the other. Dr. Howard, who has had great experience from his connexion with the fever wards of the hospital at Manchester, states that he considers the lodging-houses as the most frequent source of infectious fevers in Manchester, and he ascribes the permanence of the infection to the want of cleanliness in the beds, which are rarely purified, even after having been occupied by patients suffering from fever.

No regulations exist to provide for the removal of a patient attacked with fever, and no precautions are taken to prevent the extension of infection. A lamentable proof of the frequency and rapid spread of such disorders, in the absence of all provisions for their prevention, is given in the Report on Manchester.†

Although no provisions have yet been made by law, as far as we are aware, for the regulation of lodging-houses in any part of England and Wales, such powers have been granted for some places in Scotland, where they have been exercised with great advantage. The Commissioners of Police for the borough of Calton, which forms part of the city of Glasgow, have power to license all the lodging-houses, and to issue regulations for their proper management.‡ Under these pro-

\* Report by Dr. Duncan on Liverpool, First Report, vol. i. p. 155 ; on Large Towns in Lancashire, Second Report, vol. i.

† Report on Large Towns in Lancashire, Second Report, vol. i.

‡ Supplement to this Report, p. 192.

*Regulations for  
Lodging  
Houses.*

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visions they place a limit on the number of persons to be accommodated in each house licensed, they require that the house shall be whitewashed periodically, and that in other respects due attention shall be paid to cleanliness, and above all, that immediate notice shall be given of the occurrence of any case of sickness. Under these regulations many ill-conducted lodging-houses, the common resort of the infamous of both sexes, have been suppressed, while those now remaining, being licensed, are under the more direct control of the Commissioners.

*Twenty-eighth  
Recommendation.*

“ For these reasons we recommend that Magistrates have  
“ power to license and to issue rules, to be approved  
“ of by the Crown, for the regulation of lodging-  
“ houses for the reception of vagrants, trampers, and  
“ other such wayfarers.”

XXIX.  
Appointment of  
Medical Officer  
of inquiry.

XXIX. The most eminent medical witnesses concur in declaring, that it is by the careful observation of the causes of disease and mortality operating upon large classes of the community, that the mode and extent of their operation may be ascertained, and the power of diminishing and preventing them be acquired. For this purpose the appointment of an officer, whose duty it would be to direct his undivided attention to such causes, would in our opinion be a public benefit, more especially to the poorer classes, and might be advantageously employed in making investigations into matters affecting the sanatory condition of the district under his charge.

*Twenty ninth  
Recommendation.*

“ We therefore recommend that the local administrative  
“ body have power to appoint, subject to the ap-  
“ proval of the Crown, a medical officer properly  
“ qualified to inspect and report periodically upon  
“ the sanatory condition of the town or district, to  
“ ascertain the true causes of disease and death,  
“ more especially of epidemics, increasing the rates of  
“ mortality, and the circumstances which originate  
“ and maintain such diseases, and injuriously affect  
“ the public health of such town or populous district.”

XXX.  
The advantage of  
establishing  
public walks.

XXX. In the course of our inquiries into the sanatory state of large towns and populous districts, where a high rate of mortality and much disease is prevalent, we have noticed the general want of any public walks, which might enable the middle and poorer classes to have the advantage of fresh air and exercise in their occasional hours of leisure. With regard to all open spaces, especially well-ordered squares ornamented by trees or gardens, which already exist in the



Metropolis and large towns, we strongly recommend their preservation from any encroachment by public or private buildings. Although not open to the public, they contribute largely to the general salubrity of a town; and it has too commonly happened that, as population has increased, almost every open space has been enclosed; thus at the same time excluding the people from their former places of exercise and recreation, and preventing that ventilation which would otherwise have been preserved.

We have found this state of things very generally lamented by the inhabitants of large towns, and a very prevalent desire existing in many of them, and shared by benovolent persons of the more opulent classes elsewhere, to repair this deficiency.

The great towns of Liverpool, Manchester, Birmingham, Leeds, and very many others, have at present no public walks. Shrewsbury, Newcastle-under-Lyme, Derby, and a few more possess them.

The Metropolis, except at the west and north-west, where the different parks minister so much to the comfort and health of the people, have no public walks, though the Victoria Park, now in progress, will supply this want towards the east.

The large population of Southwark and Lambeth, to the south of the Thames, are yet without such a source of enjoyment and salubrity.

This subject was considered by a Select Committee of the House of Commons in 1833, who strongly recommended steps should be taken to supply the want. In 1840 the sum of 10,000*l.* was voted by Parliament to assist local efforts for this purpose in provincial towns; and a few places have had grants from that sum for this purpose.

In any attempt to carry out these objects we do not anticipate so much difficulty as has by many been apprehended. It sometimes happens that there is a common or waste lands in the vicinity, which, by an alteration of the law, and proper compensation given, might be made available for this purpose. The formation of a public walk would, in such case, at the same time minister to the comfort and improve the health of the inhabitants by a proper drainage of the lands in their vicinity. In many cases, local exertion and munificence would accomplish the object, if some moderate assistance was given.

“ We therefore recommend that, for the purpose of  
“ aiding the establishment of public walks, in addition  
“ to the legal facilities adverted to, the local adminis-

*Thirtieth  
Recommendation.*

*Public Walks.*

“ trative body be empowered to raise the necessary  
 “ funds for the management and care of the walks  
 “ when established.”

*Interments in  
Towns.*

Among other causes of the deterioration of the atmosphere in towns, our attention was called to that arising from the practice of interring the dead in the midst of densely populated districts ; but as the whole question of interments in towns was under separate investigation at the period of the appointment of this Commission, and was not referred to us, we have not entered into any special inquiry on this subject. Instances, however, have been brought under the notice of the Commissioners of the great evils arising from the condition of the grave-yards in several large towns, and we deem it right to draw attention to the existence of such complaints.\*

*Distinction in the  
legislative pro-  
visions for  
drainage, &c., in  
the Metropolis,  
as compared with  
the provincial  
towns.*

Although our preceding observations and recommendations apply equally to the Metropolis and other places, we think it desirable to make some remarks on those distinctions that exist between the local laws generally in operation in the provincial towns, and those that are in force in the Metropolis.

The districts of the Metropolis inhabited by the wealthier portion of the community, have received more attention in regard to regulations for promoting the health and comfort of the inhabitants than any of the provincial towns examined. This excellence only marks more strongly the contrast with the condition of the poorer districts ; many of them are quite unprovided with sewers and drains, the supplies of water are scanty and ill-distributed, and the duties of the scavenger are in general greatly neglected.

*Condition of the  
wealthy and poor  
districts com-  
pared.*

This contrast is attested in a striking manner by the annual returns of mortality for different large districts, showing a number of deaths equal to 3·5, 3·3, and 3·2 per cent. in the population of the poor and comparatively neglected districts of St. Andrew Holborn, Mile End New Town Whitechapel, and St. Luke's City Road ; while in the more improved and richer districts the mortality scarcely exceeds one-half of that rate.†

It will not escape observation that the rate of mortality exhibited in the unhealthy London districts enumerated, exceeds or equals in amount that of the worst and most neglected of

\* South Shields, Sunderland, Coventry, Ashton-under-Lyne, Chester, York.

† Fifth Report of the Registrar-General.



the great provincial towns;\* and there can be no doubt that the mass of suffering bears a similar proportion. We must, however, bear in mind that the population of the Metropolitan districts enumerated is much less than that of the provincial towns referred to.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

The system which we have found almost universal in the provincial towns, of combining under one management the duties of sewerage, paving, and cleansing, that is, the union of the surface cleansing and drainage, with the underground drainage, does not obtain in the Metropolis. These duties, which cannot be severed with convenience to their economical execution, are here placed under the management of distinct bodies, except in two districts only, viz., one within the municipal boundary of the corporation of London, and the other a narrow district under the jurisdiction of Commissioners, appointed by a Local Act for the Drainage and Paving of the Regent's Park and Regent Street. Of these we shall presently have occasion to speak more in detail.

Want of consolidation between the Boards for draining and paving.

The drainage of the remainder of the Metropolis is placed under the control of five different bodies of Commissioners of Sewers. The country to the north of the Thames is divided into four districts,—the Westminster, the Holborn and Finsbury, the Tower Hamlets, and the Poplar Marsh division; the district to the south of the river is under the management of one body only. These districts contain upwards of 2,000,000 of persons.†

Authorities for the management of the drainage of the Metropolis.

Commissions for these districts are issued under the authority of the statute of Henry VIII., the general provisions of which were previously described. Although they were applied at a very early period to the drainage and sewerage of London,‡ they do not appear to be conveniently adapted, or to have been intended for the more intricate drainage of towns, where attention is requisite, not only for the discharge of the superfluous waters from the high as well as from the low grounds, but for the removal of all refuse matter, capable of being carried off by water. This inconvenience seems to have been felt as early as the reign of James I., when an Act§ was passed to remove the doubts that had been raised as to

Commissions issued under statute of Henry VIII.

\* In Liverpool the annual mortality is 3·5 per cent.; in Manchester 3·2 per cent.; and in Bristol 3·1 per cent.

† See the map accompanying this Report.

‡ The earliest Commission for the Westminster district is dated in the year 1659, for Holborn and Finsbury 1683, and for the Tower Hamlets 1686. For the Surrey and Kent division the first Commission bears date in the 23rd year of Edw. I. (1295.)

§ James I. c. 14.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

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the jurisdiction of the Commissioners over such sewers. This statute declares that "all sewers, &c., within the limits of two miles from the city of London, whose waters have their course and fall into the river of Thames, shall be as fully subject to the Commissions of Sewers as if the same places had been specially named in the statute of sewers, and that therein the waters had ebbed and flowed, and therein free passage with boats and barges to the sea had been heretofore used." This statute placed beyond all doubt the power of the Commissioners over the existing sewers within the two miles; but it conferred no fresh power to construct new sewers. At a subsequent period, doubts appear to have been renewed with regard to the jurisdiction of the Commissioners over new sewers, and to have caused the insertion of a clause in a statute passed in the second year of the reign of William and Mary. This Act, introduced in consequence of some doubt whether such new sewers were within the jurisdiction of the laws of sewers, after reciting that many new sewers had been made, which were much neglected, and had become noisome to the inhabitants, enacted, that all new sewers made since the twelfth year of the reign of Charles II. should be under the control of the Commissioners.

Since this period, no general Act increasing the powers of any Commissioners having jurisdiction in the Metropolis appears to have been passed, and doubts, as to the powers to construct new sewers, are still maintained in some of the districts. A clause, s. 61, in the Act of 3 and 4 Will. IV., c. 22, a statute for amending the laws relating to sewers, expressly excludes the Metropolitan Commissioners from the operation of its provisions, many of which might have been most beneficially applied in aid of the existing defective laws. The several statutes that have been passed, and the legal decisions that have from time to time taken place upon their construction, seem to have placed beyond doubt the question of the jurisdiction of the Commissioners over all existing sewers, if their maintenance be for the advancement of commerce, or the benefit of society at large.

Several local Acts, relating to districts in the Metropolis, have been passed to amend and enlarge the powers conferred by the statute of Henry VIII.; but two important districts, the Westminster\* and Tower Hamlets, are still without any additional powers enabling the Commissioners to build new

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\* The local Acts that have been passed for this division are 47 Geo. III. c. 7, 52 Geo. III. c. 68, and 4 & 5 Wm. IV. c. 96. None of them contain sufficient authority to make new sewers.

Defective powers  
for the construc-  
tion of new  
sewers, in the  
Westminster,  
Tower Hamlets,



sewers. In these districts opposite constructions have been put upon the law, the Commissioners in the former district holding that it does not empower them to make new sewers, while in the latter, the law is so interpreted, that a considerable extent of new works has been executed within the last few years. We abstain from offering any opinion upon the correctness of these various views; but it is obvious that laws capable of such opposite interpretations require immediate amendment.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

The Poplar district of sewers is also without any local Act; but, being almost exclusively a marsh district, it comes within that description of low grounds which it was the object of the statute of sewers to defend from "outrageous springs." The works, chiefly river walls, are, for the most part, executed by the owners of the adjoining lands. Buildings are, however, gradually increasing in this district, and already require further legislative provision for their drainage.

and Poplar Marsh districts.

The local Acts for the city of London, for the Holborn and Finsbury, and the Surrey and Kent divisions, all contain powers more or less efficient for the construction of new sewers; but their provisions are more defective, with regard to the minor drainage, than many of the local Acts now in force for drainage in the provincial towns. They do not contemplate the proper combination of a system of house and main drainage, and the necessity of a supply of water for their efficient action, and they contain no powers to compel the owners of houses to construct branch drains in connexion with the sewers. This is a deficiency that pervades the whole of the Metropolis; and it appears in evidence, that even where new sewers have been constructed, a large proportion of the houses are still without drains, while in some districts the owners of houses have, until lately, been forbidden from allowing the waste from privies to flow into the sewers. The old drains and cesspools still remain frequently below the levels of the sewers, and are liable to become as fruitful a source of inconvenience and disease as ever. Nor have the Commissioners any power to prevent cesspools being sunk below the levels of the sewers.

Local Acts, for the city of London, Holborn, and Finsbury, and Surrey and Kent divisions.

This neglect to make drains into new sewers is attributed by the witnesses, partly to the expense rendered necessary by the regulations of the Commissioners relating to the size of the drains and mode of construction, and partly to the operation of the system of charging the whole cost on the present owner, however short his interest in the property may be.

Expensive and prohibitive regulations.

The system of charging for the cost of new sewers tends

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

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further to prohibit their use. In the older portions of the town they are usually made, in the first instance, at the general expense of the district; and for these expenses, and the cost of their repairs, all property within the level is taxed, whether receiving any direct benefit or not. But the owner of any house, who wishes to carry a drain into them, is required, besides paying the cost of the drain, often unnecessarily large and expensive, to pay a proportion of the expense of the sewer, according to the frontage of his house, a mode of charging the cost bearing very unequally upon different descriptions of property, especially upon houses at the corners of streets. An additional inducement is thus held out for a refusal to use the sewer, as, by abstaining from its use, these heavy charges are not incurred. The hardship which we have previously mentioned as arising at Manchester and other places, from the power given to the authorities to recover the expenses of such work immediately, does not occur in the Metropolis. This defect has been partially remedied by the Act passed in the last session of Parliament for amending the laws for regulating the buildings of the Metropolis.\* That Act requires proper drains to be made previous to the erection of any new house; but its effect is prospective. The object of the Act has necessarily limited its operation to the construction of house-drains, and no provisions are inserted for the building of sewers, while the frequent absence of these means of removing refuse from houses rendered it impossible to enact that cesspools should be forbidden. In the Metropolis, as elsewhere, the more general introduction of a system of sewers and drains will afford the opportunity of prohibiting these different sources of nuisance and disease. The evidence laid before us has led us to the conclusion that all the principles, which we have recommended as applicable to the provincial towns, relating to the construction of sewers and drains, and the mode of charging the expenses, are capable of being, and might be, advantageously adapted to the Metropolis.

Necessity for  
providing further  
security for the  
efficient execu-  
tion of works.

But whether the execution of these works be still intrusted to the existing bodies, or any new establishment be formed, it is necessary that before any new powers be given due security be afforded to the public, that officers should be appointed possessing the necessary scientific attainments, and otherwise properly qualified for their duties, and that the works should be executed under fewer restrictive regulations, and upon

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\* 7 & 8 Vic. c. 84, s. 51.



such principles of construction as the existing state of science points out as the most durable, and at the same time most effective and economical.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

Various examples have been presented to us in evidence to which we refer, illustrating the condition of the drainage under the system at present in operation in the Metropolis. The large number of persons now appointed in the commissions render it almost impossible to insure that they shall all be such "indifferent" persons\* as the statute of Henry VIII. requires. The names of more than 700 persons are now comprised in the several commissions of sewers. Of this number less than one-half have qualified; but the number is still unnecessarily large, and is represented as being the frequent cause of obstruction to business.† In the Westminster division the average attendance is stated to be about 30, although 150 commissioners are regularly summoned; the number is nearly the same in the Surrey and Kent district, and in the Tower Hamlets it is about 40.‡

Inconvenience of the numerous attendance at meetings.

We have stated that the Metropolis is sub-divided into several districts, for the purposes of drainage. That portion situated to the south of the Thames calls for little further notice; it appears to comprise the entire natural area for drainage, and, although the features of the country present some difficulties, the extent included within the limits of the commission gives the proper command over the natural outlet for the waters, without interruption from any other jurisdiction. The limits of the commission extend from East Moulsey to Ravensbourne; but jurisdiction is rarely exercised in any parts higher up the river than Battersea. Thus the towns of Kingston and Richmond, and the populous parishes of Putney and other places, derive no benefit whatever from this commission.§

Obstacles to drainage created by the subdivisions of the natural areas.

The Surrey and Kent.

In the Westminster district, where the commission extends from the boundary of the city, as far up the Thames as Hampton, active jurisdiction is exercised only within the narrower limits, bounded to the westward by the stream that divides Chelsea from Fulham.|| These were the limits fixed in an Act passed in the 47th year of Geo. III., extending the

The Westminster.

\* Evidence of Mr. Leslie, Second Report, vol. i.

† Evidence of Mr. Hertslet, First Report, Q. 2304, *et seq.* Mr. Leslie Q. 2801, 2810, 2811. Fo. ed.

‡ As to the charge entailed upon the rates by these attendances, see the evidence of Mr. Leslie, First Report, Q. 2835-43; of Col. Castle Gant, First Report, Q. 3015; of Mr. Daw, First Report, Q. 3177-81. Fo. ed.

§ Evidence of Mr. Drew, First Report, Q. 2670. Fo. ed.

|| Evidence of Mr. Donaldson, First Report, Q. 3984-6, vol. ii. p. 180

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

Holborn and  
Finsbury.

powers of the commissioners over the erection of all sewers, and intended to authorize the building of new sewers, but for this object its powers are stated to be defective. The districts of Hammersmith, Fulham, Brentford, are practically not under the management of the commissioners.

The drainage of two other districts to the north of the Thames is seriously interrupted by the want of the command over the natural outlets. The Holborn and Finsbury district, which extends over much land that is difficult of drainage, requiring every assistance that engineering science, unfettered by the interference of artificial boundaries, can afford, is cut off from the natural outlet, and is dependent for the means of discharging its waters upon three other districts—the city of London, the Westminster, and the Tower Hamlets divisions. The latter district is again prevented from obtaining the natural outfall by the intervention of the jurisdiction of the commissioners for Poplar Marsh.

As an instance of the inattention to the necessity of making the boundaries for drainage co-extensive with the natural area, we may state that the limits of the boundary between the Westminster and the Holborn and Finsbury districts, instead of being well marked by the natural features of the ground, were found so intricate, that in the year 1813 the commissioners of the two divisions of sewers settled the limits by a private arrangement independent of the authority of the Lord Chancellor.\*

The inconvenience, as well as the enormous loss incurred by these defective arrangements, is fully detailed in the evidence contained in the First Report. The sewers within the limits of the city having been laid in at levels, and of a capacity insufficient to convey away the sulliage brought down from the higher district, it became necessary to lower and enlarge those sewers, at an enormous expenditure. Large sums have also been expended in the Holborn and Finsbury district, to take advantage of this improvement.†

The existence of these evils may in a great degree be traced to the absence of a proper survey, such as we have previously recommended as a necessary preliminary for efficient drainage. No survey has yet been made of the Metropolis, and it appears to us that such a guide is even especially essential in the large district comprised within the jurisdiction of the Metropolitan Commissions of Sewers. A new arrangement of the districts

\* Supplement to this Report, p. 190.

† Evidence of Mr. Roe, First Report, vol. ii. p. 173.



could not be effectually carried out without that information, which can be obtained only by such means.

Although some of these districts are very extensive, the increase of buildings within them has rendered their further enlargement necessary, and the same evils that have been found to prevail in the suburban districts of the provincial towns are increasing still more rapidly in the neighbourhood of the Metropolis.

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Drainage, &c.  
in the  
Metropolis.*

Want of drainage  
in the suburban  
districts.

We have received numerous statements of such evils from the parish of Hackney, where the Hackney Brook, formerly a pure stream, has now become a foul open sewer. From the higher portions of the parish of Lambeth and the parish of Norwood similar complaints have reached us. In parts of the parish of Kensington, and in Battersea, within a few hundred yards from the Thames, the most disgraceful nuisances are found from open ditches that receive the drainage from houses. In the crowded districts of the borough of Southwark, within a very short distance of London Bridge, numerous open sewers occur. These are evils of exactly the same character that we have already pointed out as found in other towns, and capable of remedy by the application of the same alterations in the law that we have previously recommended for other populous districts.

We have already stated that in the Metropolis the paving and draining the surface of streets is placed under the management of distinct bodies from those which superintend the underground drainage, with the exception only of the city of London and a district under commissioners for draining and paving the Regent's Park and Regent-street.

City of London  
and Regent-  
street districts.  
53 Geo. III. c. 62.

These combined duties are now executed in the city of London under the powers of an Act passed in the 11th of Geo. III., amended by several subsequent Acts. The powers are vested in the Lord Mayor, commonalty, and citizens, and are to be executed by such persons as the common council shall appoint; at present they amount to about 90. The Recorder and Common Serjeant are made members *ex officio*. The Act grants to them the powers of commissioners of sewers, appointed under the general law of sewers.

11 Geo. III. c. 29.  
33 Geo. III. c. 75.  
18 Geo. III. c. 66.  
4 Geo. IV. c. 94.

The other district is now governed by commissioners appointed by an Act of the 5th Geo. IV. c. 100, consisting of the Lord High Treasurer, the Commissioners of the Treasury, and of the Woods and Forests, and such other commissioners as shall be appointed by these officers. The sewers under their jurisdiction, after draining the houses in the

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Regent's Park, pass to the southward, under Portland Place (the houses of which street are not drained by them), then commencing again at the north end of Regent-street, take the drainage of the houses in that street, and passing through Pall Mall and Cockspur-street, finally deliver their contents into the river at Scotland-yard. Some detached parts in the vicinity of Whitehall, the property of the Crown, are also under the same jurisdiction; but Portland Place and Pall Mall are under separate jurisdictions; the drainage of both these streets is subject to the commissioners of the Westminster sewers, and the paving is under the bodies intrusted with that duty in the respective parishes.

Subdivisions of  
districts for  
paving jurisdic-  
tions.

With these exceptions only the paving of the remainder of the Metropolis is under the management of separate bodies of commissioners, and is split up into no less than 84 different jurisdictions, for the government of which at least 129 Acts of Parliament have been passed within the present century. These Acts relate to many other objects besides paving, and we therefore abstain from any remarks upon other matters than those immediately connected with sanatory subjects. Many of the districts are necessarily of very limited extent, and have been formed generally with regard to the boundaries of particular properties, for the government of which separate local Acts have from time to time been obtained. The parish of St. Pancras presents the most remarkable instance of this subdivision of jurisdictions, being divided into 16 different districts; the limits are not co-extensive with any known or acknowledged boundary of a parish or other legal division, and can only be ascertained by close local inquiry, or by reference to the maps required to be deposited under some of the Acts with the clerk of the peace. Scarcely two of the local Acts agree in the mode of appointing the commissioners or in the description of qualification that they are required to possess, and they define various offences punishable in various ways; nor do they fulfil those public purposes which the wants of a crowded town require, the commissioners acting under them being quite unconnected with, and having no means of co-operating with, the managers of any of the adjacent districts. Some of these, however, comprise a large area, as the parish of Marylebone, but the preceding observations apply equally to them, so far as regards the want of uniformity in their provisions and of deficient powers of combination with the adjacent districts, for objects equally important to both.



But while these numberless isolated jurisdictions, by the unnecessary multiplication of officers and establishments, increase the expense of the works, for the execution of which the Commissioners are specially appointed, they also add to the number of officers to whom reference must be made, previous to the construction of any building or any sewer or drain. The variety of officers to be consulted on such occasions, and the different rules in force in the several districts, has been represented to us as a serious inconvenience and loss. The District Surveyors, the Commissioners of Sewers, and the Commissioners of Paving, all to a certain degree acting independently of each other, must be referred to; and, if water or gas is laid on, the servants of two other independent bodies, both having powers to interfere with the pavements, must likewise be called into operation. The District Surveyor is now required to inspect the construction of drains of new buildings; but he has no power over the main sewers, with which those drains are to be connected, nor can he insure to the builder of a house that there shall be a sewer to carry off the contents of the drains, which are now required to be made. In the same way, the Commissioners of Pavement drain the surface of the street with little or no control over the sewers into which the water flows, and in some districts the gratings and the gully-shoots are the property of the Commissioners of Pavement, in others of the Commissioners of Sewers. One officer would be capable of inspecting the erection of buildings, the construction of the drains, both for the houses and the streets, and the formation and management of the pavements, and we cannot too strongly express our opinion of the important benefits that would accrue to the public by a consolidation of these duties in each district under one officer and one administrative body.\*

*Laws for  
Drainage, &c  
in the  
Metropolis.*

Unnecessary  
multiplication of  
officers.

To remedy some of the defects arising from the insufficient provisions of many of these local Acts, a general Act (57 Geo. III. c. 29) was passed for the whole of the Metropolis, comprising the bills of mortality, and the parishes of St. Pancras and St. Mary-le-bone. This Act extends the powers of any existing Commissioners, and enables them to pave, drain, and improve the streets by widening them, and to prevent nuisances and obstructions therein. Among other useful powers conferred by this Act, the Commissioners of Paving are enabled to contribute, from the rates raised by

\* Evidence of Mr. Kelsey, First Report, vol. ii. p. 225. Evidence of Mr. Foden, vol. ii. p. 324. Evidence of Mr. Austin, vol. ii. p. 350. Mr. Butler Williams, vol. ii. p. 475.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

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Want of authority for regulating the supply of water.

them, towards the repair or erection of sewers. This provision might have been most beneficially applied in those districts of sewers where the Commissioners are without power to raise money for the construction of new sewers; but it does not appear that advantage has ever been taken of this provision.

But among the numerous functionaries above enumerated, exercising a supervision over works of construction, no body of persons is intrusted with the charge of securing a supply of water for domestic purposes. The mode of supply in the Metropolis is open to the same objections that we have previously pointed out in other towns, while the defects in the system of distribution and charging is frequently more striking. Although there is no portion of the town into which the mains and pipes of some water companies are not carried, yet we find large numbers of the houses of the poorer classes receive no supply. In the district supplied by the New River Company, containing about 900,000 persons, about one-third are unsupplied; and in the district of the Southwark Company, 30,000 persons have no supply; although the pipes of more than one Company are carried into some parts.\* A still greater proportion can obtain water only from stand pipes, common to a large number of persons, and supplied only at intermittent periods. We have already pointed out the evils of this system, and we have no reason to believe them to be less injurious in London than elsewhere. They are attributable to the same causes,—the natural reluctance of the companies to supply the poor except through the medium of the landlord, and the expense of a separate cistern or water-butt for each house necessarily entailed by the system of intermittent supply.

As a remedy for these evils, we think that the same principles of legislation above recommended for other large towns, are equally applicable to the Metropolis, with such modifications as the varied circumstances of the localities may suggest in the constitution of any administrative body for the control and direction of local works.

Our attention has been especially called in the Metropolis to the necessity of securing a liberal supply of pure water to the poorer classes by pipes, and rendering them independent of pumps and wells. The practice, hitherto almost universal, of retaining all refuse in cesspools beneath houses has,

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\* Evidence of Mr. Mylne, First Report, vol. ii. p. 113. Evidence of Mr. Quick, First Report, vol. ii. p. 115.



in many parts of the Metropolis, so entirely saturated the soil with injurious matter, as to render unfit for use the water obtained from pumps and wells. To this cause of injury may also be added the pollution from the escape of gas: this is not, however, confined to the wells; the water [in pipes does not escape contamination from this cause. Mr. Mylne\* presents instances of such evils, and gives an example of the number of gas-pipes, belonging to competing companies, that are frequently found traversing the same streets. He states that the whole of the soil is in some streets so completely saturated with gas, that if the boxes of the fire-plugs are covered for a few hours, the coal-gas collects so abundantly within them, as to ignite on the application of a light. This effect has been witnessed by members of this Commission. We are not prepared to offer an opinion how far this nuisance may be lessened by additional care in forming the joints of the pipes; but the facts adduced before us appear to afford reasons for consideration whether some means should not be adopted for regulating the number of gas-pipes to be laid in any one street. Most of the gas companies are already liable to be placed under regulations with regard to the mode of their supply.† In the Acts for the establishment of gas as well as water companies, clauses are usually inserted to prevent the laying down of gas-pipes within four feet of the water-pipes, and making other provisions for security against the contamination of water. A system of constant supply, to which we have so frequently adverted, by keeping the water-pipes continually full would materially contribute to prevent the indraught of the gas.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

Contamination of  
water by soakage  
from cesspools  
and gas-pipes.

Before we conclude our remarks upon those points which appear to require especial notice in the Metropolis, we wish to call attention to a memorial‡ presented to us on behalf of two out of the three water companies at present supplying the district to the south of the Thames with water. The facts disclosed in this document, which had been partially stated to us in evidence,§ present a forcible example of the ruinous consequences of excessive competition, and similar instances

Effect of com-  
petition among  
the water com-  
panies in the  
Metropolis.

\* Evidence of Mr. Mylne, First Report, vol. ii. p. 109.

† In the Acts relating to the seven Gas Companies in London we find it enacted that the stations and works of the Company shall be open to the inspection of any persons appointed by the Secretary of State for the Home Department, and that the Company shall conform to such regulations as the Secretary of State shall consider necessary and proper, and shall direct to be adopted for the more effectually lighting the several parts of the Metropolis, and for securing a proper supply of gas for the public lamps, and for such other purposes as to the Secretary of State shall seem meet and proper for the advantage of the public. Supplement to this Report.

‡ Supplement to this Report, p. 193.

§ Evidence of Mr. Quick, First Report, vol. ii. p. 133.

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Drainage, &c.  
in the  
Metropolis.*

Effect of com-  
petition among  
Water Compa-  
nies.

may be adduced from all the water companies in the northern part of London.\* The competition that occurred among these companies in the year 1812 and subsequent years having reduced them to the verge of ruin, ultimately caused them to make an arrangement for the division of the whole of the north of London into several districts. The reduction in the rates charged, and the expense incurred for laying down pipes, had left the proprietors for several years without a dividend, and without the means of making alterations in their works for improving the supplies. Since that period, great improvements have been effected by several of the companies.

But, although the cessation of the competition has enabled the companies to effect such improvements, the dividends are necessarily sacrificed for the purpose; neither do their arrangements to confine themselves within certain limits secure them from the risk of further competition. In order to improve the operation of the present system, it would appear to be necessary that the Legislature should enable the water companies to raise additional funds for the improvement and extension of their works, and, as far as practicable, protect them from ruinous competition; and, on the part of the public, it may be fairly required that the system of supply should be greatly improved, and a more regular and liberal supply insured to the poorer classes. A consolidation of some of the existing establishments leading generally to a diminution of the cost of management, and of works, would afford large means of economy. We entertain a confident expectation from all the facts of the case, and the best opinions we have been enabled to consult upon this important subject, that by the application of the principles of improvement developed in the course of this inquiry, ample supplies of pure water may be conveyed to every tenement of the poorest class at low rates of charge, whilst a saving of existing expenses, combined with an amended system of levying the water-rates will afford a good remunerative rate of profit upon any additional capital that may be required.

The principles, which we have recommended for adoption for the regulation of the supply of water in the provincial towns, were many years since suggested in relation to the Metropolis. The Committee of the House of Commons that inquired into the subject of the supply of water to the Metropolis in the year 1821, reported its opinion that the system

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\* The companies supplying the north of London are—the Chelsea, the Grand Junction, the West Middlesex, the Hampstead, the New River, and the East London. Those on the south, are—the Southwark, the Vauxhall, and the Lambeth. See the map accompanying this Report.



Map  
of the  
(METROPOLIS)  
showing the  
Districts of Sewers.

REFERENCES.

North of the Thames,

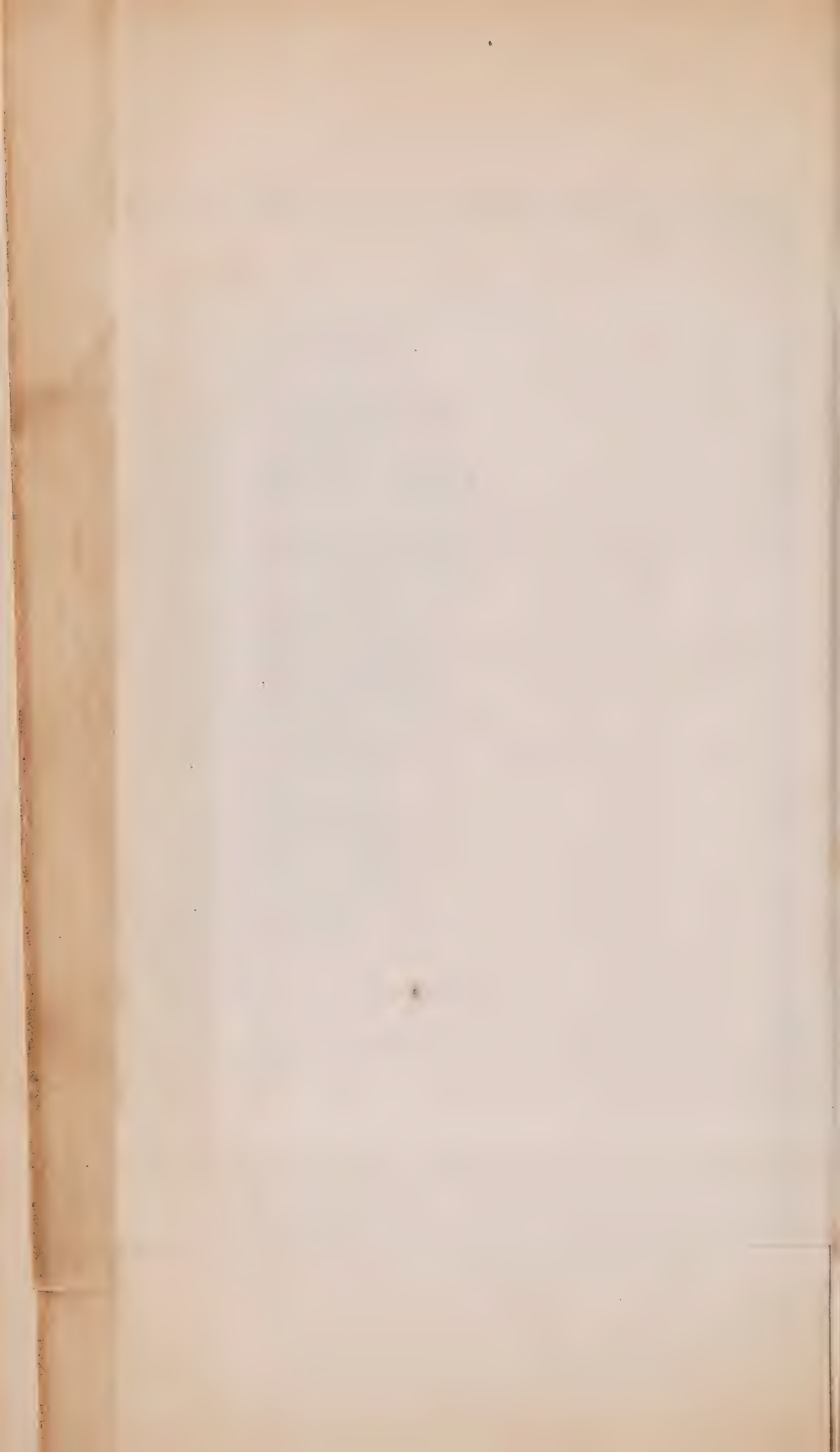
- GREEN . . . WESTMINSTER & PART OF MIDDLESEX  
RED . . . THE REGENTS PARK. The narrow  
line shows the Sewers passing through parts  
of the District under the Jurisdiction of  
the Westminster Commission.  
YELLOW . . . HOLBORN & FINCHURCH  
PINK . . . THE CITY OF LONDON.  
BLUE . . . TOWER HAMLETS.  
WHITE . . . POPLAR MARSH OR BLACKWALL.

South of the Thames,

- PURPLE . . . SURREY & KENT.









Map of  
THE METROPOLIS  
Showing  
The Districts  
supplied by the different  
WATER COMPANIES.

**North of the Thames.**

GREEN	—	COMPANY	source of supply at C. near the RED HOUSE
YELLOW	—	WESTMINSTER	HAMMERSMITH
PURPLE	—	ST. JAMES	KEW BRIDGE
BLUE	—	ST. JAMES	SPRINGS ON THE HILL
PINK	—	ST. JAMES	RIVERS AMWELL & A
BROWN	—	ST. JAMES	RIVER LIA

**South of the Thames.**

BLUE	—	SOUTHWICK COMPT	BATTERSEA
YELLOW	—	LAMBETH COMPANY	PELOPS ACRE near
PINK	—	VATWALL COMPANY	VATWALL BRIDGE

*Note.* Where the Blue & Pink are intermingled the pipes of the Southwark & Vauxhall Companies are in competition. Where the Pink & Yellow are intermingled the pipes of the Vauxhall & Lambeth Companies are in competition. In some parts as in the New Kent Road, Dover Road, Newington Causeway, Kennington Road, Gravel Lane, and other places the three Companies are in competition.







of the supply of water was not subject to the operation of the usual laws which govern supply and demand, and that it "indispensably required legislative regulation." We find that in the same Session of Parliament a Bill was introduced, (we understand with the concurrence of some of the water companies,) by which it was proposed to establish referees to decide any questions of dispute that might arise between the public and the companies. It is much to be regretted that this measure was not passed into a law; we hope that the proposal now made on the part of the companies supplying so large a portion of the Metropolis to enter into arrangements to regulate the present system, will lead to the establishment of an authority for that purpose. We are confident that, by placing the management of the supply of water under such a regulation, the greatest benefit will ensue both to the public and the companies themselves, and that such an arrangement will afford the best security against the risk of injurious competition.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

Effect of com-  
petition among  
Water Compa-  
nies.

We have now brought under review all those points relating to the Metropolis which appear to us to require a distinct notice. Some of the subjects already considered in the former portion of this Report are now provided for in special Acts relating to the Metropolis. Provision has lately been made for the regulation of buildings, the width of courts and alleys, the prevention of many nuisances, and the construction of house-drains for all new houses. Further legislative enactments are required to improve the laws relating to sewers and the construction of drains to existing houses, to combine the duties of the underground with the surface drainage, to improve the cleansing of small streets, courts, and alleys, and to insure a more liberal and better distributed supply of water.

In submitting to your Majesty the measures we recommend for ameliorating the physical condition of the population inhabiting large towns and populous districts by improvements in drainage, cleansing, ventilation, and the supply of water, we must again express our deep conviction of the extent, importance, and difficulty of the subject—a conviction strengthened by the continuance of our investigations. The most important evils affecting the public health throughout England and Wales are characterized by little variety, and it is only in the degree of their intensity that the towns exhibit the worst examples of such evils. Villages and clusters of houses inhabited by the poor are often under the influence of the same causes of disease, though their effect in such situations may

General Concl -  
sion.

*Laws for  
Drainage, &c.  
in the  
Metropolis.*

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be frequently rendered comparatively slight from the more free circulation of the external air. The vitiation of the atmosphere from over-crowding, and the absence of proper ventilation in individual apartments produces in the rural districts the same disease that arises from the same causes in a town population.

Though we venture to consider that the recommendations we now lay before your Majesty will, if sanctioned by the Legislature, tend to diminish the evils into which it has been our duty to inquire, we cannot conceal from ourselves, that in many cases a considerable time must elapse before permanent structural arrangements can be placed on that footing which their importance requires. Though those, who may be specially intrusted with the execution of the legislative powers recommended, will be enabled, by an earnest discharge of their duties, to accomplish great good, we still look to the co-operation of the public for important aid in the removal of those causes of disease to which the poorer classes of your Majesty's subjects are more peculiarly exposed; we do this the more confidently from the interest that has been recently manifested so generally on this important subject, and from the extent to which causes affecting public health have been made known through so many different channels, leading to the introduction of simple, economical, and highly beneficial improvements even in the humblest dwellings. With such co-operation, we have the greatest confidence that vast physical benefits will ensue, and that they will be accompanied by a corresponding improvement in the moral and social condition of the poorer inhabitants of large towns and populous districts.

All which we humbly certify to your Majesty.

(Signed)	BUCCLEUCH.	(L.S.)
	LINCOLN.	(L.S.)
	ROBT. A. SLANEY.	(L.S.)
	GEORGE GRAHAM.	(L.S.)
	H. T. DE LA BECHE.	(L.S.)
	LYON PLAYFAIR.	(L.S.)
	D. B. REID.	(L.S.)
	RICH <sup>d</sup> . OWEN.	(L.S.)
	W. DENISON, Capt. Royal Eng.	(L.S.)
	J. R. MARTIN.	(L.S.)
	JAMES SMITH.	(L.S.)
	ROBT. STEPHENSON.	(L.S.)
	W. CUBITT.	(L.S.)

*Gwydyr House, Whitehall;  
February 3rd, 1845.*



## MINUTES OF EVIDENCE.

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*James Aspinall, Esq.*

1. Are you chairman of a Committee appointed under the Liverpool Health of Town and Buildings Regulation Act, passed in 1842?—I am.

2. Is this Committee connected in any way with other Boards of improvement, such as the sewerage and scavengering, or the parish authorities?—No, it is not; it is independent of the Highway Board and of the Parish Board. The Highway Board and the Sewerage Board are the same.

3. Do you consider that this absence of connexion with Boards so intimately connected with matters relating to health renders the operations of your Health Committee less effective than they might otherwise be?—I think not; I think they are better separated.

4. The sewerage and the supplies of water and the scavengering being so intimately connected with health, and all those being points which must tend to render the population healthy or diseased, according to the mode in which the measures are carried out, do you think that a Health Committee, having for its object the preservation of the health of the town, can operate efficiently without being connected with such Boards?—My own private opinion is that we are better separate, because we are differently constituted. The Health of Town Committee is under the Corporation, and the Highway Board and the Commissioners of Sewers are under a particular Act. The qualification is totally different.

5. Do you think it advisable that they should be under different authorities? Would it not be better if they were under one authority under the Corporation, so that they should be all connected together?—I should think they are better separated.

6. Have your Committee any authority over the proceedings of the body who manage the drainage?—No, certainly not.

7. How are you enabled to carry out any recommendation you may make with respect to alterations or improvements of the drainage, which bears upon the health of the humbler classes, if you have no authority upon that subject?—We have no power to compel any drainage from the humbler class of houses in any Act we have.

8. Then your Committee has no power to carry out any alteration which they may suggest in the drainage?—Certainly not. We have the power of compelling upper drainage, by putting channels in courts, but we have no power over the under-drainage; that is entirely in the hands of the Highway Boards and Commissioners of Sewers.

9. The powers under the Health of Town Act apply chiefly to buildings, the width of courts, the flagging and paving, and the management of the surface?—And the channelling of the courts; everything relating to the upper-drainage.

10. It is an open drainage?—It is.

11. Supposing that the cleansing is very defective in any one of those courts or in any one of those narrow places in Liverpool, and that the Health of Town Committee, seeing that to be the case, are desirous to have it amended, have you any authority to enforce your wishes?—Yes, we have the power of making bye-laws which are not in operation now, but we are waiting for the Metropolitan Act and what may appear from this Board, before we carry those bye-laws into operation. We have the power of compelling the people to cleanse the courts under a penalty.

12. But you have no power over the Commissioners for Cleansing?—No.

13. You have no power of enforcing your wishes through them?—No; the Watch Board are the scavengers of the town, which is also a Board under the Corporation.

14. Their authority does not go into the close courts at all, does it?—Not at all. There are four Boards,—the Watch Board, which has the scavengering, and the Highway Board, which has the management of the Sewerage, and the Health of the Town is a different Board.

15. The authority of the Scavengering Board does not go into those close courts, so that there is no authority for cleansing those close courts?—Except the bye-laws we shall make.

16. And then the cleansing will be done through the medium of the people themselves?—Yes.

17. You say that you think these various Boards had better be separated, because they are differently constituted. Supposing they were not differently constituted, and that they were so constituted as to act in combination together, do you think that would be an improvement?—My reason is this, that the Highway Board, generally speaking, is a Board that acts for years; the Health of the Town Board is elected from the Corporation, and is liable to be changed every 1st of November, and therefore you get new members upon that Board, and they are not so thoroughly acquainted with the operations under the Act, as a Board that has been constituted for years, such as the Highway Board.

18. The question is not whether they should be put under the Corporation, but whether, if it could be so arranged that they should act in combination, it would not be better than to have several Boards intimately connected with the health, all acting distinctly, without combination?—I am not prepared to say that. I am a member of all the Boards myself, and therefore I know how they do act. I have been a member of the Highway Board for 12 years. The operations are so totally different that I am hardly prepared to give an answer, but I think there is so much to do by each Board that it would be too much for one Board to do.

19. Then the Health of Town Committee, in endeavouring to carry out their benevolent wishes for the improvement of the health of the various districts, put forth certain recommendations, but you have no power to carry them out. The Sewerage Board and the Cleansing Board may or may not follow your recommendations, so that you have not the advantage of being able to enforce that which you recommend?



—No, the town is not sufficiently sewered now, and we have not funds to carry it out. The expense of cleansing the town properly would be enormous, and how it could be carried out I do not see.

20. Was this Improvement Act obtained in consequence of some facts elicited on the reports of your surveyors on the state of the town? —Yes, it was.

21. What amount of population was found to reside in cellars situated in courts, and in cellars situated in streets?—I should say about 50 to 55,000 altogether; there were about 21 or 22,000 in courts; but it must be observed that although that number reside in cellars, in courts, yet, there are only 1252 cellars, containing about 5000 souls, which are let independently of the houses according to the returns of the surveyors for the north and south district.

22. How many in cellars in streets?—I should say about the same number.

23. Altogether about 45,000 residing in cellars?—Yes.

24. Was there found to be a considerable part of the population in courts and alleys?—Yes, a considerable part.

25. Then, in fact, it was ascertained by survey that nine-twentieths, or nearly one-half, of the population of the parish of Liverpool reside in courts and cellars?—In the parish of Liverpool. The Municipal Reform Act brought other districts into the borough of Liverpool.

26. The Corporation considered that this was so detrimental to public health that they applied for the Act referred to for the purpose of abating that evil?—They did.

27. What powers are given in the Act for improving the health of the town by diminishing the number of cellar dwellings?—There is a clause that the cellar dwellings shall be a certain height from the ground, and that they shall consist of a certain number of square feet, and that they shall be seven or eight feet high.

28. The clause which applies to this subject is the 11th clause?—It is.

*(The same was read as follows :—)*

“And be it enacted, That from and after the First day of July, One thousand eight hundred and forty-four, it shall not be lawful to let separately, except as a warehouse or storehouse, or to suffer to be occupied, as a dwelling place, any cellar or room under any other house whatsoever, which cellar or room shall be less in height from the floor to the ceiling than seven feet, or which shall be less than one-third of its height above the level of the street adjoining the same, or otherwise shall not have two feet, at least, of its height from the floor to the ceiling above the said level, with an open area of two feet wide from the level of the floor of such cellar or room up to the level of the said street, or which shall not have attached thereto the use of a privy and an ash pit, according to the enactment herein contained, or which shall not also have a window of not less than three feet square, or otherwise of an area of not less than nine feet clear of the sash frame, and a fire-place with a chimney or flue, or being an inner or back cellar let or occupied along with a front cellar, as part of the same letting or occupation, shall not have a ventilating chimney, unless such inner or back cellar, shall be part of a house built before the commencement of this Act.”

29. Have you formed any estimate of the number of persons who will be removed from cellars in compliance with the Act?—I think

about 5000 or 6000 in courts. I should say that almost all would be removed in compliance with this Act.

30. You issued a notice for their removal?—We issued a notice for the 1st of May this year. There was a notice given that they were all to leave before the 1st of May, and we found there were so few that would comply with the Act that we were obliged to extend it to the 1st of July. What we are to do with those poor creatures when we turn them out, or where we are to place them, I do not know. We find it very difficult to remedy the evil.

31. Have the public authorities, or any associations of private persons, made arrangements for accommodating so large a number of persons on their removal?—Certainly not.

32. Is this clause of the Act compulsory?—Yes.

33. So that if you do not obey the Act you may be prosecuted?—We may, if we do not carry out the Act. A great number of those cellars are under the Corporation leases, and therefore, we are just as liable to be prosecuted as the landlord.

34. So that, in fact, you are bound to expel 23,000 persons in cellars, out of courts, from their dwellings on a given day without having provided means of accommodation for them?—Certainly.

35. What must be the consequence of such a step?—I am not aware. I should say that a great number of those unfortunate wretches would have to be provided for by the parish.

36. Many would go into houses?—Many would go into houses. Three or four, or five families would go into a house, where only one or two families were before.

37. Are there any houses of the poorer sort building upon speculation for the purpose of accommodating those persons?—Not that we are aware of.

38. It has been stated by physicians of great eminence that one principal cause of the unhealthiness of Liverpool is the crowded state of its population in the poorer districts. So that the summary abolition of cellars, as dwellings, must, in the first place, at least, increase this evil?—That is the opinion of two eminent gentlemen whom we have on our Board of Health, Mr. Blackburn and Mr. Chalmer. We had a very eminent man who died about a month ago, Mr. Boutflower, and it was decidedly his opinion also. They all considered that if the poorer classes be driven to the necessity of going into the old houses in the courts, which were built before our Act passed, and which cannot be altered, and where three or more families are living together, the evil would be greater. The houses now building will be more expensive than the abodes which they are compelled to leave, and they cannot afford to go there; and it is very natural for them to go where they can get the cheapest residences.

39. Are you aware of the fact which has been ascertained in Liverpool, that there is much more sickness in cellars than in houses?—In damp cellars; but you will see that there are dry cellars, damp cellars, and wet cellars.

40. The question is, whether great distress would be occasioned by the sudden expulsion of such a large number from cellars without houses being provided for them?—Certainly, and I cannot see how the evil is to be remedied if it is to be done instantaneously.



41. No steps have been taken by the Corporation to select the worst cellars first for the expulsion of the inmates?—We have been obliged to carry out the Act, and we have given notice to all.

42. Have there been many instances of cellars being disused, as dwellings, in consequence of this Act?—Yes, lately; but we were obliged to extend the time from the 1st of May to the 1st of July. Now there are several families quitting, and many cellars are being altered according to the Act.

43. Your Act gives power for regulating buildings, the width of streets, courts, &c.?—That is in the Building Act. It is in our Act also.

44. In this respect is the Act retrospective, or is it framed with a view to prevent the aggregation of evils in old districts, without amending or promoting the health of those districts?—Certainly. With the exception of compelling them to flag and channel their courts it is prospective.

45. In clauses 4 and 5 it is enacted, that no carriage way shall be less than 24 feet wide, and no court, closed at one end, less than 15 feet. Have you found those clauses to be efficient?—Certainly not.

46. In what way have you found them defective?—We have found that 15 feet at the entrance of a court is not sufficiently large if it is confined at the entrance, and I am sorry to say that in most of our courts there is merely an entrance; in many cases they merely put an entrance of 15 feet, and then the rows of houses go up in a wedge shape branched off like a tree.

47. That evades the intention of having a good current of air coming into it?—Yes. I do not care whether it is 5 or 6, or 15 feet if you have not a current of air, or a sufficient space for the air to rush up.

48. Are each of those branch courts 15 feet wide?—Yes, we are very particular about it. If it is two or three inches too little we make them take it down.

49. The entrance is 15 feet wide, but they evade the Act by making a great many branches, and have only one entrance to all those branches?—It is evading the spirit of the Act. The Act was never intended to allow that. If I might suggest any thing, I should say that if it was not open at one end, they ought to increase the width at least to 20 feet; but, I should say, 24 feet would not be too much, if there is not to be a current of air.

50. There is no restriction under this Act as to the depth of those courts?—Not at all; they may extend to any length.

51. So that it is nominally a court, but it is, in fact, a prolonged street?—Yes.

52. Was it thought a sound principle to fix a minimum width of 15 feet for courts without reference to the height of the buildings? Might not the Act be further evaded by running up high buildings of several stories, similar to those in Edinburgh or Glasgow?—You might run them up to any height.

53. So that the circulation would, in fact, be impeded?—Yes.

54. Is that, in fact, done?—Yes, they are three or four stories high.

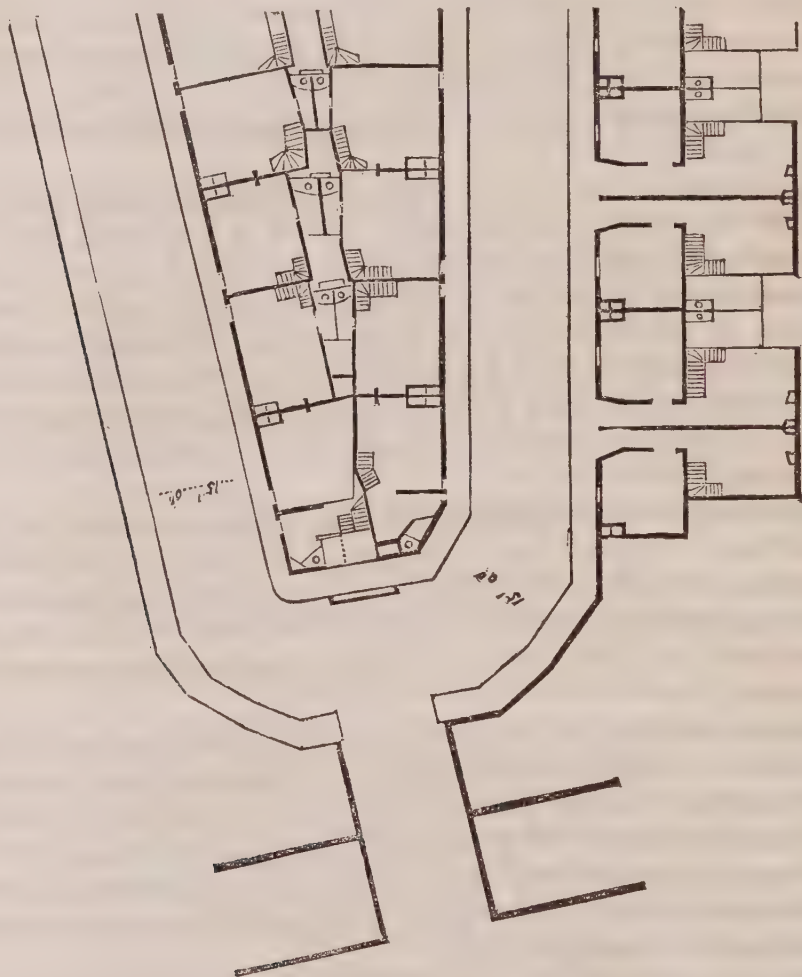
55. Are the houses back to back?—Some houses have small yards and privies, and cesspools.

56. Then there is a small space at the back of each house?—Yes; some, but not all.

57. Have the houses been run up higher than they were before, two or three stories?—Yes.

58. So that the Act is evaded in that way?—Yes.

59. The yards which contain privies and cesspools are between those high houses?—Yes, and they have to come down. I should say that that is a very great nuisance. This engaged the attention of the Committee, and we took the opinions of two eminent counsel upon it, and they said that it came within the Act, and that we could not interfere. Annexed is a plan of one of the courts lately built.



60. It is to be presumed that the object of fixing a minimum width for courts, closed at one end, was to secure for them a proper ventilation from the open or exposed end?—Certainly.

61. In some cases, is not the width of the entrance diminished to the width of six feet by the erection of privies and ash-pits?—We do not allow that now, it was so.

62. You have the power to do so by the Act?—We always find that there is something or other that will put a stop to it, and we have set our faces against it, as much as possible, as it is a great evil.

63. Your opinion is that, as the only entrance for air is from the front, if privies and ash-pits are erected there, it must become charged with all the filthy emanations from those places?—Certainly.



64. It was represented by both your surveyors that the mode of cleansing cesspools and ash-pits by private nightmen was an intolerable nuisance, alike injurious to the property of the owners, and to the comfort, health, and morals of the occupiers. Have you powers in the Act for the more efficient cleansing of privies and ash-pits?—No.

65. You have a clause to compel the occupiers to clean them out at 14 days' notice?—Yes, it must be done between sunset and sunrise. I think it cannot be done before 11 o'clock at night, or after 5 o'clock in the morning.

66. The clause gives you power to compel the occupiers. Are not those occupiers generally weekly tenants?—Most of them are.

67. Therefore they are a migratory population?—They are.

68. As you have to give 14 days' notice to those tenants, is not the clause altogether inoperative?—It is.

69. You have no power to appoint a regular scavenger whose duty it shall be?—No.

70. The expense of cleansing an ash-pit and a privy is considerable?—It is.

71. Then the occupier will rather remove from his dwelling than bear that expense?—He will.

72. Then the clause is of no avail?—It is.

73. And the consequence is, that it remains undone?—It does. Sometimes, when those cellars cannot be let for a month, you often find them half filled by the filth deposited in them.

74. You have power in the Act to oblige the owners of houses to erect privies to them?—Yes.

75. And you exert that power?—Yes, we are very particular as to that.

76. What rule do you follow?—We do not approve of any plan for new houses unless they have a sufficient number of privies to those houses—say a privy to two houses; the privies must be open at the top, and there must be a flue to every privy.

77. Have you the same power with regard to existing houses?—We cannot touch those.

78. In your Health Act you proceed upon the supposition that a sufficient supply of privies and ash-pits is adequate for the preservation of health, and that it is not necessary to obtain the thorough and immediate removal of decomposing refuse by water?—I do not think, as those courts are constituted, you can remove it by water.

79. You proceed upon the supposition that it is not necessary?—That it is not practicable. You cannot bring the water into the sewers to remove it.

80. Would you consider it an improvement in the Act to have power to effect that?—I think not.

81. Why not?—Because I do not think that in that part of the town there is sufficient fall into the sewers to carry it off; and I do not think you could get a quantity of water sufficient to carry it off.

82. Are you aware that there is a prohibition in your Sewerage Act against the connexion of soil-pipes from water-closets with the public sewers?—There is a clause to that effect. I think it is evaded very much; but parties are allowed to carry the overflow from their privies and water-closets into the sewers.

83. Does not the very fact of its being evaded show the importance

it is of to the inhabitants to have that communication?—I think that eventually the Act must be altered.

84. Must not the consequence of the prohibition be to prevent the construction of water-closets, or, if not to prevent them, to check the extension of them?—No, I should say not, because I think they have cesspools in their yards; and they have also necessities, which are cleaned by the night-soil men.

85. The cleansing of cesspools necessarily implies considerable expense, at least to some person; therefore, must it not tend to check the formation of water-closets by increasing materially the expense of their formation?—Yes.

86. Therefore that clause does check the extension of water-closets?—I do not know how far that may be the case throughout the town; but I do not think that if water-closets were turned into the sewers there would be more water-closets than you have now in the better class of houses.

87. The question refers to the poorer classes?—I do not think the poorer classes have anything of the kind.

88. Is not that because it is so expensive?—Yes.

89. Then, as this clause renders greater expense necessary, it prevents the poorer classes from having water-closets?—Exactly. But though there is plenty of water for the use of the town at Liverpool, it is impossible to get the same quantity of water as you have in London to carry off this mass of corruption by water.

90. So that this clause operates by increasing the number of cesspools in your town; or in other words, by retaining the refuse which it is the legitimate object of sewers to remove?—It never was contemplated to take that off by the sewers.

91. What is the use of sewers? Is not the use of sewers to remove refuse from the town?—Exactly, but not of that description. It is a grave matter for consideration whether the filth and soil from water-closets being allowed to go into the sewers, and thus pass through a great portion of the town, emitting noxious smells to escape from the eyes of the sewers, is not more detrimental to the general health of the inhabitants than when it runs into cesspools upon the premises of the occupants, and emptied only when necessary, because the cesspools can be so constructed as to be perfectly air-tight, and prevent any escape unless when emptied.

92. Is not that the use of them in London and other places?—If they have plenty of water.

93. Are you one of the Commissioners of Sewers?—I am.

94. You have not introduced sewerage clauses into your Health Act, as you consider your Sewerage Act to be sufficient?—I think so.

95. Do you know Mr. Holme, a builder in Liverpool?—I know Mr. Samuel Holme very well.

96. Do you consider, from his experience in town matters, that he is well fitted to express correct opinions upon the sewerage and other structural arrangements in Liverpool?—Certainly, no man more so.

97. In describing the sewers of Liverpool, Mr. Holme says, “Notwithstanding the Commissioners of Sewers have expended above 100,000*l.* in new sewers and paving during the last few years, very much remains to be done, even in the principal thoroughfares, before



our sewerage can be considered to be accomplished. And although the Commissioners will permit any person on application to make a branch drain into the public sewer on payment of the sum of 18s., yet with strange perversity they forbid an overflow from a water-closet to be turned into them; and the consequence is, that nearly all the water-closets are discharged into open ash-pits or cesspools, impregnating the atmosphere in numerous places, and exposing that offensive matter to the surface, and to the decomposing effects of the atmosphere, which ought to be carried by the public sewers into the main artery of the river, and the air is thus tainted through the mistaken views of those whose function it especially is to provide the means of carrying off this effluvium." He says also, "In numberless instances courts and alleys have been formed without any declination for the discharge of surface-water. Many are laid without channels; and while the solid refuse thrown upon them rots upon the surface, the liquid matter is absorbed, and much of it finds its way into the inhabited cellars of the courts. The north end of the town is full of pits of stagnant water, which form so many receptacles for the putrid matter that is constantly thrown into them, such as dead animals, the drainage from starch and other manufactories; and in hot weather the stench from these places is frequently intolerable. The whole of the north end of the town being, as I have before described, a bed of clay, these poisonous pools are never lessened except by evaporation, and from these, and the imperfect drainage, and other causes to which I shall advert, instead of being surprised at the mortality of Liverpool, I am surprised that the mortality, taking all things into consideration, is so exceedingly small." He states, "There are thousands of houses and hundreds of courts in this town without a single drain of any description; and I never hail anything with greater delight than I do a violent tempest, or a terrific thunderstorm, accompanied by heavy rain; for these are the only scavengers that thousands have had to cleanse away the impurities and the filth in which they live or rather exist." Do you coincide with him in his description of the state of sewerage at Liverpool?—Yes, certainly.

98. In the evidence given in by the Health Committee to this Commission, it is stated that the Commissioners that act under the authority of the 11th of Geo. IV., since 1839, have constructed 33,440 yards, or 19 miles, of sewers, at an expense of 100,000*l*. Have you any reason to believe that there is any error in those numbers?—I believe not. I have a letter on the subject from Mr. Ashlin. I sent for this information to Mr. Ashlin, who is our treasurer and clerk, and he said that he had no reason to alter his opinion.

99. In the neighbouring town of Manchester the cost of sewers, that is, of excavating, building, relaying, and procuring materials, is 15*s*. per lineal yard. The cost of sewers in Liverpool is estimated at 33*s*. per lineal yard. Are you aware of the cause of the difference in price?—After some of our sewers have been made we have been obliged to take them up and enlarge them. There is a sewer in Church-street, made a few years ago, and so many sewers have been put into that sewer, that it was not sufficiently large and sufficiently deep.

100. Therefore this enormously increased expense is owing to a deficient system of scientific sewerage at the outset, to their not having taken a sufficiently large area for operations, and to the work having

been deficiently executed ; and all those unscientific arrangements for the sewerage are now to be remedied at an enormous cost ?—In one or two instances.

101. The sewers in Manchester are generally larger than has been found necessary by experience in London, the reason assigned being that this increased size is necessary on account of the quantity of water discharged from the manufactories in Manchester. Is there any similar reason for increasing so materially the size and expensiveness of the Liverpool sewers ?—Generally, no.

102. From the experience of Manchester, 19 miles of sewers could have been constructed for 25,080*l.*, or, according to the estimate of the average expense of construction in Liverpool, for 55,176*l.* ; but as the Liverpool Commissioners have expended 100,000*l.* upon the construction of their sewers, it appears that the actual expense of construction in Liverpool is nearly double the estimated amount of 33*s.* per lineal yard, or nearly quadruple the amount for which it is stated in evidence that efficient sewers are constructed in Manchester. Can you state the reason for the very great difference between the estimated and the actual expense of construction in Liverpool ?—The sewers stated to be executed in Manchester at an average cost of 15*s.* per yard vary in size from 15 inches by 12 inches to 42 inches by 24 inches, and of the latter size only one has been executed between June, 1838, and May, 1844, and it appears that during that period no sewers larger than 42 inches by 24 inches have been constructed ; but that between 1836 and 1838 one was built 60 inches by 36 inches, at a cost of 41*s.* per yard ; and two, 72 inches by 36 inches, at a cost of 40*s.* 5*d.* per yard. The average price stated for sewers, in Liverpool, viz., 33*s.* per yard is for sewers varying from 42 inches by 36 inches to 48 inches by 36 inches, made of sufficient depth to drain the cellars. The greater part of the 19 miles of sewers made between 1829 and 1840, were main sewers, encircling the borough, or acting as great arteries to receive the subsidiary sewers, since made, and now making, and varying in size from 60 inches by 36 inches to 72 inches by 54 inches ; the great north tunnel, running from Crown-street to Beacons-gutter, was 3 miles 320 yards long, and of the above sizes, and cost about 58*s.* per yard ; and such was the size of the Parliament-street sewer, 2400 yards long ; the Dale-street sewer, 1800 yards long ; the Hanover-street sewer, 2400 yards long, and many others ; and few sewers are constructed less than 46 inches by 30 inches, which enables men to enter and clean them.

103. Have the Commissioners constructed sewers within the last year in many streets inhabited by the poorer classes ?—Three thousand yards have been done the last year ; and within the last six weeks we have ordered 7200*l.* to be laid out in sewers, entirely in that part of the town which has not had them before ; all in the lower districts of the town, such as Frederic-street, &c. The Sewerage Board were bound to construct the sewers in accordance with the plan deposited for the Boundary-street. After they accomplished this, they then did those streets which in their opinion was most wanting of sewers, under the advice of their late surveyor, Mr. John Foster. I have also a return of the flagging of courts and alleys that has been done in the town of Liverpool under the Health Act. The quantity of flagging which has been done in the south district is 8375 square yards ; in progress, 1400 square yards ;



the quantity of channelling is 4797 $\frac{3}{4}$  lineal yards ; and in progress, 600 yards. In the north district the quantity of flagging done is 6881 $\frac{1}{2}$  square yards ; in progress, 1360 ; of channelling, 3539 ; and in progress, 660.

104. As a general statement, may it not be safely said that the Commissioners of Sewers in Liverpool have principally sewered the large streets, the streets containing shops, and the residences of the wealthier classes of society, and have not sewered so much in the poorer districts?—Some of those streets are so extremely narrow that you cannot sewer them. Their attention has been paid to all the poor streets that they possibly could, particularly lately.

105. Has this been owing to the necessity of sewerage those streets first in which the highest rates are paid?—I think not. I had a house in Duke-street, where I resided from the year 1814 to within these three years, and I have not a sewer within a quarter of a mile of my own house, although I was a Commissioner, and that is one of the principal streets in Liverpool.

106. It being an undoubted fact that sewers have been principally constructed in the larger and more wealthy streets of Liverpool, and that few have been constructed in the poorer streets, is this owing to the necessity of sewerage first those streets which paid the highest sewerage-rates?—I do not think there was any reason for the Commissioners doing that. I think the Commissioners sewered those streets first that they thought most required it. My opinion is that in a dense population some of the streets are so extremely narrow, and are so small and low, that it is quite impossible to sewer them at all ; others we have done within the last few years, in consequence of the same power given us by the new Act.

107. Supposing that the expense of sewerage were levied, as in Manchester and Little Bolton, on the owners or occupiers of the houses, according to the frontage of their property, are you of opinion that the sewerage of Liverpool might be proceeded with much more quickly than by the system of general rates?—I think general rates seem to have answered very well, and they have been collected very well ; besides, it seems to me unjust that an individual should be required to pay for a sewer according to the frontage of his property, when he has contributed to the general rates for a period of 12 or 14 years, without deriving any particular advantage therefrom. I should therefore prefer the general rating, that all may be placed on an equality to share the burden and partake of the benefit.

108. During the same period in which the Commissioners in Liverpool have constructed 19 miles of sewers, at an expense of 100,000*l.*, derived from general rates, the Corporation of Manchester have built 32 miles of sewers, by the system which has just been mentioned. Were you aware of this fact?—Not at all.

109. As the Commissioners of Sewers in Liverpool have proceeded with activity, must it not be owing to the difference of the system that so little has been done in Liverpool in comparison with what has been executed in Manchester during the same period, particularly as regards the poorer districts?—I can answer that thus far, that we are limited in our rates in Liverpool ; that we could not levy more than so much in

the pound, and that the whole of that sum has been expended that we had the power by the Act of Parliament to levy.

110. But you have not done upon your system much more than one-half what they have in Manchester?—Exactly, because we have not the power.

111. As the immediate call for the outlay for sewerage and paving in the poorer districts of Manchester has been found to be very oppressive, do you think it would be an improvement in the system if the expense incurred were paid back in equal annual instalments, with interest, within a given period, say 20 or 30 years; that is, that supposing 10,000*l.* is laid out this year, instead of levying the whole of that by an immediate rate, it should be levied by a rate extending over 20 years, and be paid back by instalments?—I do not see how it could be done.

112. Have you not received complaints of the burden of the expense of flagging?—It has often happened that when our surveyors have gone to apportion the different sums of money to be paid by each person who has a right of passage in different courts, we have found one or two individuals not able to pay at all; that the mortgage has been to the full extent of the value of the house, and the mortgagee has received the whole of the rent as interest, and they have absolutely not had a farthing to do anything, and therefore that has stopped the proceeding.

113. Suppose the expense of laying down a sewer, or paving the court, amounted upon each house in the court to 5*l.*, those houses, perhaps, would not be able to pay the 5*l.*, but they could pay 5*s.* annually, which would pay it off in a certain number of years?—Yes, I think it would be very easy to do it in that way. In many instances the distress is dreadful, and we know that they cannot pay; but we know human nature is such, that if you were to excuse one or two you would have one or two thousand making the same complaint.

114. You say that in many cases the cottage owners have not been able to pay; that the whole of the rent has been absorbed in the mortgage interest; then would it not be better to pay the expense of the improvement in 30 equal annual instalments than to demand it all at once?—Certainly; but my opinion is this, that you are giving facility to men that can pay best. I am sure the cottage owner in Liverpool is a rich man; that in ninety-nine cases out of a hundred the cottage owners are able to pay.

115. And that they ought to be made to pay?—Yes; and that they do not now.

116. In that case you would come immediately upon the owner, and not upon the occupier?—Yes. I think the cottage owners in Liverpool are men that have a large per centage for their outlay.

117. But you stated just now that it was so oppressive to the owners that they could not pay?—That is only in a few cases, where a man only owns a few cottages; but generally those courts are built by owners that are able to pay, and who will not pay.

118. Then any method that could be devised to bring them into assessment, and make them pay, would be an advantage?—That is my opinion.

119. Are there many owners of property of this description whose interest is of short duration?—There are a great number under Corporation leases.



120. Then the expense of improvements operates oppressively upon them?—Not always. I am glad to say that Lord Derby, who has immense property in Liverpool of this description, the very moment this Act came into operation gave an order to his agent, and the whole of his courts were done by himself, at his own expense.

121. But in those cases where there are short leases and short interests was it not severely oppressive?—Certainly; but we are going on the long leases now, and the freehold property. There is a great deal of Corporation property that will come out before the year 1850, and they mean to do away with many of the courts. The Corporation are going upon a very good system; they are going to do away with as much of that property as they can. Where the houses will have to come away in a year and a half, it would be hard to make those people flag those courts, when those courts are going away altogether. Therefore the Health of Town Board have taken the long leases—all that are above 21 years.

122. It has been stated in a letter of Mr. Tomlinson, a barrister of the Inner Temple, that small house property “frequently changes hands, and is generally held by persons of limited means, for short terms, not unfrequently by poor widows, who have no greater interest than for their own lives, and is sometimes held, as in Liverpool, under leases from the Corporation, for the remainder of a term, which the parties have not the means of renewing. Even when owners of the property have the inheritance, such houses are usually first built by small shopkeepers, or retired tradesmen or publicans, and latterly, I am happy to add, by working mechanics out of their savings, or else by builders of small means, who sell the buildings as soon as finished to persons of the former description.” He says, “the temptation to possess such property is the high rate of profit returned from the investment, averaging, I believe, about 8 per cent. Against this is to be set off the labour of frequent collection, and the constant and anxious superintendence which such property requires.” Does that agree with your views?—Yes.

123. Then to people of the class mentioned here the immediate outlay necessary for improvements must be very severely oppressive?—Very.

124. Then you would approve of the principle of spreading the expense over a period of years, so as to render it less oppressive?—Yes, to such people as those, if you can make your clause stringent. There are so many that evade the Act—that really will not pay, and plead poverty—that it ought to be very stringent.

125. Are those cottages exempt from the poor-rates?—The cottage owners are.

126. Are the rates levied upon the occupiers?—The occupiers are rated. The cottages in Liverpool of the annual value of 12*l.* and under are all included in the poor rate; but the payment of the rate is not enforced, the magistrates being unwilling to grant warrants against this numerous class of occupiers, alleging that they ought to be excused on the score of poverty.

127. Is that the case always?—I think almost always.

128. Are they rated under a special Act?—Yes; we have a special parochial Act.

129. With regard to scavengering, Mr. Holme states as follows. He is asked in what manner the streets are cleansed, and he says, "There are scavengers (generally paupers) employed in cleansing the surface of the streets. The parochial authorities contract with parties for the removal of the mud, &c., for manure; but I am not aware that there are fixed gangs of men to certain districts, for I believe that when the superintendent reports upon a street it is ordered to be cleansed. On this point, however, I do not speak with certainty; but, generally speaking, the streets are in a filthy condition in the lower and northern parts of the town, and are, at certain seasons, especially near the Docks, almost impassable." Are you of the same opinion as to the state of the streets?—They are in a very dirty state, certainly.

130. It is stated in the evidence of the Liverpool Scavengering Committee that there are 65 scavengers engaged in sweeping the streets, and that every street is swept once in the week. Are you aware that in Edinburgh, and in other towns where there is much less traffic than in Liverpool, the streets are swept once every day?—I am not aware of that; but I am quite sure that the Liverpool streets are not swept often enough.

131. It is calculated that 1000 yards form the amount which can be effectually swept by a scavenger in one day. Now, as there are 95 miles of streets in Liverpool which require sweeping, they must contain at least 1,337,600 superficial square yards, on the assumption that none of them are wider than 24 feet (the smallest size allowed by your Act); so that with the 65 scavengers in Liverpool, according to this estimate of a man's labour, all the streets could not be more effectively gone over more often than once in three weeks. May not this deficiency of force account for the filthy condition of the streets of Liverpool, as described by Mr. Holme, and other competent witnesses?—I should say that there is less attention paid to that than almost any other arrangement in the town.

132. That is to say, the going over the streets once a week is merely the rule, but it is not the practice?—Certainly.

133. Do you use Mr. Whitworth's machine?—No, but they are going to adopt it. There is one thing I wish to mention, that last year, since we have had more Macadamizing than we had before, the cleansing of the town from the Macadamized roads has cost us 700*l.* or 800*l.* more than it did in previous years; and what is taken from the Macadamized road is not valuable, whereas what was taken from the other was valuable.

134. In clause 20 of the Health Act, powers are given for the cleansing of houses stated to be in an unwholesome condition. Have you yet exercised those powers?—We have not; the by-laws are preparing, but we want to see the Metropolitan Act, and the Report of this Commission, before we pass our by-laws.

135. It has been fully pointed out by witnesses before this Commission that the state of houses as to cleanliness is intimately connected with the supply of water. How are the poorer classes in Liverpool supplied with this necessary article for health and cleanliness?—I should say that the poor are very badly supplied.

136. Is it not the case that the water companies serve districts with



water only every other day, and then only for a few hours at a time?—It is.

137. So that if the poor have not sufficient vessels to hold the water necessary for two days' supply, or if they do not happen to be at home during the hours of service, they are deprived of the benefit?—Certainly.

138. Taking one house with another, cisterns with ball-cocks cost about 2*l*. So that the alternative of building them necessarily implies a very large investment of capital, which might be saved if the water were kept on constantly in the mains at high pressure, as done at Nottingham, Ashton, and Preston. Are you of opinion that the introduction of a similar system in Liverpool would be productive of great benefit to the health of the town?—I think if they could find the water; but I do not think that if the water was on every day, and the mains were full every day, there would be a sufficient quantity.

139. Are not you going to have plenty of water by means of some new water-works?—Yes, under the new Act.

140. If it could be done it would be a great advantage?—A very great advantage.

141. Are you aware that under the system of constant pressure in those towns which have just been mentioned, it has been found by experience that there is actually less waste of water than on the system of intermitting supplies?—I have reason to believe so from what I have heard.

142. Are you decidedly of opinion that the present mode of supply by the water companies is quite inadequate for the preservation of health and cleanliness in the town?—I think there is not sufficient for the poorer classes of the people.

143. Has not the absence of water in your mains proved a serious evil on the occurrence of fires in Liverpool?—Very serious.

144. You have obtained an Act for introducing water to remedy this evil?—Last year.

145. What expenditure will be required for that purpose?—50,000*l*., and 500*l*. a-year is allowed by the Corporation.

146. Is it the case that a clause in the Water Companies' Acts states that they shall keep water always on in the mains, but that no penalty being attached to its evasion the companies have not done so?—They have not done it.

147. And you have suffered in consequence at fires?—Yes. I have been at fires myself, being the deputy chairman of the fire committee, when I have known more than half an hour to elapse without getting a drop of water.

148. And because the Companies have refused to do so, or have abstained from doing so, the Highway Board, or rather the public, is to be put to the expense of 50,000*l*., and 500*l*. a-year?—Yes.

149. Are there not two Water Companies in Liverpool at present?—Yes; the Bootle and the Harrington.

150. They have mains laid down in the same streets, and they supply the same districts?—Yes.

151. Are the mains of the new water-works also to be laid down along with those of the present Water Companies?—In some of the same streets.

152. So that thus three capitals and three interests must be paid by the public, whereas one capital and interest would have been sufficient if the supply of water had been efficiently and properly conducted, and had been placed under proper control, so as to protect the public from overcharge?—Certainly. It is my opinion, that if the Gas Companies and the Water Companies had been under the same direction that they are at Manchester, we should have had a better supply of water, and that our rates would have been much less.

153. If the three Companies are to be remunerated, does it not follow that the public must pay three times as much for water as they would pay for water under one Company, properly managed and regulated?—Clearly it would be cheaper; but it does not follow that it would be one-third cheaper.

154. Mr. Holme states as follows: "Liverpool is supplied with water by two public Companies, each having an Act of Parliament, which confers upon them a monopoly of supply. One is termed the Bootle Water Company, the other the Liverpool and Harrington Water Company. The former Company raise their supply from springs at Bootle, distant from the Exchange three miles; and the latter have wells in various parts of the town. The original shares of 100*l.* in the Bootle Company are now worth, in the market, 380*l.*, and those of the Liverpool and Harrington Company are worth 610*l.* The charge for supplying water for domestic use is 1*s.* in the pound on the rental, and it is usually supplied every other day. It therefore follows that, had the corporation or the parochial authorities originally supplied the water from the public funds, and no legislative enactment had given to these Companies exclusive privileges, that we should have been supplied with water at one-sixth of the present price; or, if we had paid the same price, a large disposable revenue would have accrued to the public local exchequer, which would have diminished our taxation, or have enabled the authorities to have established public fountains, and had public reservoirs for the use of the poor in every locality." Do you agree in that?—I will not go so far as one-sixth, but I agree with him that it would be very much cheaper; I agree with him in principle.

155. Does not the same principle apply to your rival Gas Companies?—Certainly

156. Are you aware that in Liverpool with rival Gas Companies you pay 7*s.* per 1000 cubic feet?—Yes; the very moment we threatened them with a new Company they took it down 1*s.*, and they promised to take it down 6*d.* more.

157. You were paying 7*s.* per 1000 feet; they have reduced it to 6*s.*, and they have promised to give it you at 5*s.* 6*d.*?—Yes.

158. While, with one establishment in Manchester, 5*s.* 2*d.* per 1000 feet is charged?—Yes; I have heard so.

159. There is now an application for a third Gas Company in Liverpool?—There was; it was thrown out.

160. Then in your opinion the effect of establishing a third Company, instead of lowering the price of gas, would ultimately be to raise it, as instead of one capital and interest to pay as in Manchester, the public in Liverpool have already to pay two capitals with interest, and in the event of a third Company being established must have to pay three if the



Companies are to be remunerated?—I did not exactly agree with their prospectus; but they went to Parliament with the idea that they were to give it us much cheaper.

161. Are you a shareholder in any of the Gas Companies?—I have no shares in either water or gas; here is a statement of the price to-day. In the New Gas Company the price per share was 217*l.*, and in the old 241*l.*

162. What was the original share?—100*l.* each.

163. What was the original price of the water shares?—I believe the Harrington Company was originally 200*l.*, and the Bootle 100*l.* The Bootle Company never any fixed sum. The original shareholders were about 330 in number, and paid calls from time to time as the works were in progress, but it has been a losing speculation to the original shareholders. I have also a return of the prices of those shares to-day; the shares of the Harrington Company are 645*l.*, and of the Bootle Company 414*l.*

164. Does not the high price of water which you have stated necessarily imply a denial of water for the purposes of drainage and for the purposes of water-closets and other public uses?—Yes.

165. And also supplies of water for fires?—Yes; but with regard to the supply of water, I do not think we can find the quantity of water that is wanted.

166. Did the Water Companies, on the application of the town for an Act to obtain a supply for extinguishing fires, endeavour to limit it to the supply of salt water to the mains, in order that it might not be used for domestic purposes?—Yes, they did.

167. What was the expense to which the Commissioners of Highways were put by the resistance of the Water Companies to an extended supply for the use of the town?—The Bootle Company did not oppose the Bill; but the other Company, the Liverpool and Harrington, did in the Committee of the House of Commons. The amount of expenses incurred for promoting the whole Bill exceeded 2600*l.*; what proportion was incurred in consequence of the opposition I cannot exactly state.

168. Did they succeed in preventing your using that supply for domestic purposes?—For sale. We may give it to the poor, and we may make use of it for all public purposes, but we are not allowed to sell it. I have got also an account of the baths in Liverpool. For the North baths the estimated cost is 4300*l.*, including wash-houses. The number of private baths is 18, nine for males and nine for females. There are four shower-baths, two for males and two for females. Four vapour-baths and a large plunging-bath is contemplated. The premises contain 925 square yards of land, which are occupied by the baths and wash-houses. The bath portion of the building is to be two stories high. The cost of the South baths, in Frederic-street, was 2300*l.*; keeper 90*l.*; servant 30*l.*; fireman 46*l.* 16*s.*; coal and water 100*l.*; making 266*l.* 16*s.*; and the income is about 270*l.* All that we want to do is just to cover the expenses.

169. The charge contemplated is very low?—It is very low; there is no profit contemplated.

170. Are those baths very extensively used by the poorer classes?—They are.

171. Is the use of them increasing?—It is.

172. Is not the water sometimes exhausted by the extent to which they are employed?—No; by the neglect of the Water Companies.

173. But it is the fact that they sometimes run out of water?—Yes; but we contemplate now supplying those places by our own mains. There is not a single fountain or a single public pump in the town for the use of the poor; the poor are obliged to pay for every drop of water they get.

174. What do they pay?—From 2*d.* to 3*d.* a-week. Those cottage owners pay so much for a court to the Water Companies. If there are 10 houses in a court they pay 8*s.* for each house. Then the owner collects the rents by the week, and charges the poor people 2*d.* to 3*d.* a-week, so that he charges 12*s.* 8*d.* for each house whereas he only pays 8*s.*

175. He charges 50 per cent. upon the tenant additional?—Yes.

176. You say that the usual charge is about 2*d.* a-week?—At 2*d.* and 3*d.* I know from what I have heard that they have charged them about 50 per cent. profit upon the rate.

177. In Liverpool lately objections were made to horizontal smokeless flues connected with plans in operation in different buildings. Are you aware that there is any peculiar practice or regulation by law in Liverpool, with respect to the manner in which smoke flues must be applied in buildings?—No, there is not.

178. Nothing beyond what comes under some very general Act?—Nothing but the general Act.

179. Is it not the general opinion in Liverpool, as it is in many other towns, that the returns of mortality are not strictly correct, because they include a large amount of migratory population; which, in the opinion of the authorities of Liverpool, has the effect of making it apparently more unhealthy than it really is?—Decidedly it is so. We were under the New Poor Law Act for a year or two, and I happened to be a magistrate of the county and *ex officio* chairman of the committee, and it came under my particular notice that that really was the case; that the bills of mortality were very defective on account of the migratory population.

180. You mean that there is an apparent increase in the mortality in consequence of the population not being resident but being migratory?—Yes.

181. That the number of deaths among the migratory population being greater in proportion than among the resident population in Liverpool, it makes the mortality appear larger than it ought to be?—Certainly; that is the prevailing opinion in Liverpool.

182. Have you paid any attention, as Chairman of the Health Committee, to vital statistics?—No, I have paid none.

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*John Leslie, Esq.*

183. When you were last examined before this Commission, you expressed an opinion, derived from your experience of the mode of conducting the business of the Westminster Court of Sewers, that the present constitution of those Courts was ill adapted to the performance of the duties entrusted to the Commissioners: has your further experience tended to confirm that opinion?—Most decidedly so. I have



attended most closely to my duties, and have arrived at the conclusion, that an entire change in the mode of appointment of the Commissioners, and also of the constitution of the Court itself, ought to take place.

184. It appears in evidence before this Commission, that a large proportion of the acting Commissioners are in practice in the district as architects, surveyors, agents, or solicitors, or otherwise connected with building property; do you consider such appointments beneficial to the public interests?—Most decidedly not.

185. Is there no provision in the law to prevent Commissioners from acting in cases in which they are interested either as principals or agents?—Not in the law as interpreted in the Westminster Commission of Sewers. It is a circumstance of constant occurrence, and upon every occasion I raise my voice against it.

186. Is the King's Scholars' Pond Sewer covered in to any considerable extent since you were last examined by this Commission?—Not to any very great length. The Court recently came to a resolution to cover in a certain portion at the public expense, consequent upon a portion being covered in by Mr. Cubitt at his own expense. The whole history of this abominable nuisance will show the imperfection of the present system of appointing Commissioners of Sewers, and how prejudicial its operation is to the public.

187. Will you give this Commission an outline of the history to which you allude?—The then existing line of sewer for this district was in 1807 minutely surveyed by John Rennie, Esq., civil engineer. He reported that it was not only laid down in so irregular a direction, but so imperfectly executed, in such bad repair, and had so bad an outfall into the Thames, that it would only be wasting money to attempt to render it perfect. He considered it advisable that this sewer should not be the principal channel by which so important a district should be drained. He next stated that, independently of its bad direction and imperfect construction, its outfall into the Thames is so low, and this low or flat land continues to such a distance backward, that, were even the higher parts of the sewer perfect, this alone would be sufficient to condemn it. He then lays down the axiom, that a perfect drainage can be best effected by a perfect outfall, and that such outfall cannot be found in the low and flat marshes between Whitehall and Chelsea. He states he could not find such an outfall higher up the Thames than Scotland-yard, and fixed upon Northumberland-street, where the declivity of the ground extends quite to the Thames. He finally laid down a line from the north end of Baker-street to Piccadilly at the end of Berkeley-street, thence turning eastward to Northumberland-street, thereby cutting off all the immense northern drainage from crossing the Green Park round the Queen's palace, and down the low and flat lands to the present outlet. The length of this line was 13,015½ feet. But from Piccadilly, at Berkeley-street, to the Thames, the distance was only 4,600½ feet on Rennie's line against 8,005 feet on the old line, a difference of 3405 feet.

188. What was the whole length of the old one?—16,522 feet. The distance saved would have been nearly two-thirds of a mile. Mr. Rennie also stated, as to the form of the sewer,—“I have no hesitation in saying that it ought to be made like a canal tunnel; the bottom should be an inverted arch, the sides curved, the top a kind of ellipsis

approaching nearly to a parabolic form, having the longer axis upwards; the pressure is generally most irregular at the top, there being so much loose earth above, and therefore the form should be suited to sustain that irregular pressure." In this line he obtained a very great fall of  $76\frac{1}{2}$  feet in the whole distance, or  $\frac{2}{10}$ ths of an inch in every yard. The size of the sewer should be, he reported, 6 feet wide at its commencement and  $8\frac{1}{2}$  feet at the lower end. Mr. Rennie's attention was subsequently called to a plan to take the sewer across the Park to Horseferry-road; but, although he considered this proposed plan as second only to the one he had already submitted to the Commissioners, it increased the distance to the outlet at the Thames 2,709 feet; and for the last 5,412 feet of this proposed line, the top of the sewer must be considerably under the level of high water. He then states that the objections to his plan, as to render it ineligible, are not evident to him.

189. Does he mean to infer by that, that the sewer proposed by him would not be below the level of high water?—Yes; because at Northumberland-street there is a great declivity, extending quite to the Thames.

190. Was Mr. Rennie's proposition adopted by the Commissioners?—No.

191. Do you consider the rejection of Mr. Rennie's plan to have been advantageous to the public interest?—As it appears to me, from a careful attention to the subsequent proceedings of the Commissioners, and from the expense incurred on the existing sewer, most decidedly the reverse.

192. Can you state to this Commission any of the grounds upon which you have come to this conclusion?—Certainly. They are chiefly on these important points, an enormous outlay of public money, a bad drainage, and a most intolerable nuisance of an open sewer, where the water is penned back during a considerable period of each tide, instead of a great public improvement of a closed sewer with a good outlet to the Thames, as suggested by Mr. Rennie.

193. Was any cause suggested by the Commissioners for not proceeding with Mr. Rennie's plan?—I have found no minutes to that effect in the records of the Court.

194. What is the length of the open sewer?—5,238 feet; but a portion has recently been covered over by Mr. Cubitt (viz., 1,009 feet) at his own expense.

195. So that Mr. Cubitt, for the advantage of the houses in the neighbourhood, as a private individual, not on the public authority, has been induced to cover in a portion of this sewer at his own expense?—Exactly so; but Mr. Cubitt's interest, as a great builder, requires him to do so.

196. Do you know what has been the outlay on the open portion of King's Scholars' Pond Sewer since Mr. Rennie's report against it?—I have a return by me of the principal items from 1808 to June, 1844, and the amount is 70,104*l.* 17*s.* 5*d.*, between 13*l.* and 14*l.* a foot for what is at present a most disgraceful nuisance in a great metropolis.

197. How soon after the rejection of Mr. Rennie's plan did the outlay upon the line he had condemned commence?—Almost immediately. A special Committee was appointed to direct the works from Charlotte-



street, Pimlico, to the outlet at the Thames; and this Committee met 47 times, commencing 23rd August, 1808, ending 9th January, 1810.

198. Can you inform this Commission what portion of the 70,104*l.* 17*s.* 5*d.* was expended at that time?—Above 23,000*l.* was then laid out. Of that sum there was spent for dinners, and extra coach-hire to the special Committee, 626*l.* 7*s.* 6*d.*; and for compensation for damage, 862*l.* 10*s.*

199. Do you happen to know who were the contractors at this period?—Yes; two Commissioners of Sewers, Messrs. Holland and Rowles.

200. When you state they were Commissioners of Sewers, do you mean they were Commissioners of the Westminster District of Sewers?—Certainly.

201. Who was the surveyor?—A Mr. Treadgold, a carpenter, builder, and surveyor, in Farm-street, Berkeley-square.

202. Do you happen to know whether he had seen the reports of Mr. Rennie condemning the line of sewer?—It is evident that he had; because, in a report he made to the Committee subsequently to Mr. Rennie's report, he says, 11th June, 1808, "Begging it may be understood that I am most perfectly convinced of the superior advantage of Mr. Rennie's plan, I now proceed, in obedience to the directions I have received, to consider what alteration will be required in the existing sewer from Berkeley-street to the Thames to make it capable of draining the whole district as well above Berkeley-square as below it, extending from Hampstead to the Thames by Tothill Fields."

203. Does he appear to have been aware of the extent of the drainage?—Certainly; he states the length and breadth of the sewer and the district, and as the sullage must be retained there more than four hours in every tide, that it would require a reservoir for the sullage of nearly 24 acres, without reckoning the addition necessary for the enclosures, slopes, &c.

204. Notwithstanding the reports of Mr. Rennie against the line, and the corroboration of his opinion by the surveyor's report just quoted by you, the works proceeded on the condemned line?—Certainly; and under the direction of a Special Committee of Commissioners.

205. Do you know the names of the Commissioners who formed the Committee?—Yes; I have a return by me showing the names and attendances of that Committee, with the expenses for dinners, &c., which, if this Commission requires, I will hand in.

206. Of how many persons did this Committee consist?—The Committee was nominally composed of 34 Commissioners, but some never attended at all and others seldom.

207. Do you happen to know if any of the Commissioners who acted on this Committee had property on the line condemned by Mr. Rennie?—Several of them had.

208. When was the next large outlay on this open sewer?—It begun about nine years after, and was as follows; in 1819, 1820, and 1821—28,378*l.* 2*s.* 4*d.* Out of this sum the compensation amounted to 4,298*l.* 14*s.* 9*d.*

209. To whom was this compensation paid?—This was paid to above 40 individuals, in sums varying from 20*s.* to 600*l.*; some of whom were undoubtedly Commissioners.

210. When was the next large expenditure?—It began at the end of another ten years, viz., in 1832 to 1836; works, 11,238*l.* 15*s.*; engineers, 748*l.* 8*s.* 3*d.*; compensation for the damage and the law proceedings, not actually paid until 1841, 2,243*l.* 4*s.* 9*d.*; total, 14,230*l.* 8*s.*

211. Under what statute do the Wesminster Commission of Sewers appoint Committees?—I know of none, and always object to that course on account of its illegality.

212. After all the enormous outlay upon the open part of this line, much remains to be done?—Certainly; the favourite plan among the most influential Commissioners is still for a reservoir. Mr. Cubitt has offered for the purpose a piece of land which is leased to him by the Crown. The following is something like the plan in embryo:—To cover in the sewer, down to White's Bridge, at an estimated expense of 6,386*l.*; to widen the sewer 20 feet for 830 feet in length, at an estimated expense of 6,600*l.* more. And after this 13,000*l.* had been expended, in addition to the 70,104*l.* already spent on 5,238 feet, there would still remain an open evaporating surface for the filth of this immense district of 4,644 superficial yards; the uncovered length would then be 1,045 feet long and 40 feet in width. If, finally, this reservoir were to be arched over 40 feet in width and 1,045 feet in length, I should imagine 10,000*l.* additional would hardly defray the expense.

213. When an uncovered sewer passes through any property or near any houses, does it not in general put the inhabitants of the immediate vicinity of such sewer in a worse condition, than if they had had no such sewer in the immediate vicinity?—Certainly.

214. Do you consider it to be just or equitable in principle that the occupiers and owners of houses in the immediate vicinity of such uncovered sewers should be put to the whole expense of covering them up for their own protection, or that that should be done at the general expense, to cure evils which, as in the case of the main sewers, have been created for the general benefit?—In this particular instance the parties built their houses upon the line of open sewer; and I very much doubt the legality of making people pay, who are residing in the upper parts of the district for a benefit which is local.

215. Does the 70,000*l.* expended comprehend every charge during that period?—Certainly not; only the principal works, not the annual expenses thereon.

216. Do you happen to know how the various sums to defray these and other expenses were raised?—Nominally by the presentment of juries, but which juries for many years of the period were selected for the purpose, and some of them actually the tradesmen of the Court.

217. Can you state any particular instance of large outlay where the persons who were to receive the amount of their accounts from the rates served on the juries?—Certainly; the house No. 1, Greek-street, Soho, where the Sewers' Office is now held, affords a striking case. The house was purchased of the family of a deceased Commissioner for 5,000*l.*; it cost to repair and fit it for the purpose of the Commission, including 148*l.* 12*s.* 6*d.* interest on the tradesmen's accounts, and also including 219*l.* 1*s.* 10*d.* law charges, 4,903*l.* 3*s.* 1*d.*; making the total charge to the public for that office within a fraction of 10,000*l.* The



tradesmen who were employed and received an amount of nearly one-half of the sum expended in repairs and alterations appear to have been upon the juries at that period.

218. The juries having presented the parties, do you know what the amount of the rates were about that time, commencing with the works at the open part of the King's Scholar Pond Sewer?—The decrees for the various districts were signed as follows:—

		£.	s.	d.
1808.	September 7 . . .	12,899	1	0
1809.	May 26 . . .	25,835	2	8
1811.	March 15 . . .	27,343	8	4
1812.	November 24 . . .	38,197	8	0
		<hr/>		
		£ 104,275	0	0
		<hr/>		

219. You have stated that the purchase of the office in Greek-street was 5,000*l.*, and that the repairs, &c., cost 4,000*l.* and some odd hundred pounds more?—4,903*l.* 3*s.* 1*d.*

220. Can you give this Commission any details of such expenditure?—I will hand in two returns which will give the detail, excepting the Parliamentary and dinner expenses of the Commissioners and the Committee.

*(The Witness handed in the papers.)*

221. When did the local Act pass enabling the Commissioners to purchase the house?—52nd Geo. III., local and personal, cap. 48. Royal assent, April, 1812.

222. Was there any outlay before the Act passed?—Yes; because a lease of the premises was first taken, which was executed on or about the 29th March, 1811, for a term expiring at Michaelmas, 1833, at a rent of 260*l.*, and land-tax 24*l.* 17*s.*, with a proviso to purchase the freehold. A list of tradesmen to be employed in the repairs was made out in April, 1811, and the office was publicly advertised to be open at Christmas, 1811.

223. Consequently the enormous expenditure in repairs and alterations must have been incurred prior to the legal authority being obtained to enable the Commissioners so to expend the rates?—Certainly.

224. Do you know the course that was adopted by the Commissioners with respect to obtaining the Act of Parliament to enable them to purchase and fit up this office?—Yes; two surveyors were appointed to value the premises; and, as appears from the documents, their sworn valuation amounted to very little more than the sum expended in repairs and alterations alone; but as I have a copy of the valuation, I present it to this Commission.

*(The Witness handed in the paper.)*

225. That valuation appears to be nearly 500*l.* less than the sum required by the vendors?—Yes; and as I said before, the valuation was but a mere trifle over the outlay in repairs and alterations. I can, if necessary, obtain for this Commission an extract from the minutes of the Parliamentary Committee of the 4th February, 1812, which will show the course of procedure.

226. Was Mr. George Saunders, who presided at this Committee, the gentleman who was Chairman of the Court of Sewers from March, 1808, to February, 1835?—The same person, I believe; an architect or surveyor, residing in Oxford-street.

227. Under what authority does the Commission for Westminster, &c., appoint an annual chairman?—We have a bye-law for that purpose, but I deny the legality of the appointment. It throws into the hands of one Commissioner such an enormous power, which the statutes and Commission contemplate shall be exercised only by six Commissioners in open Court; and it appears to me to have been and still is a very improper appointment; and it further appears to me to have been the cause which originated the doubtful section in the general law on sewers, viz. 3 and 4 Wm. IV., c. 22, s. 61: “And be it further enacted, that nothing in this Act contained shall extend or be construed to extend to affect, alter, abridge, or interfere with any local or private Act of Parliament for sewers concerning any county, city, town, district, lands, or limits, or any Commission of Sewers in the County of Middlesex, within the distance of 10 miles of the Royal Exchange;” and which is considered by the Westminster Commissioners to exonerate them from the very salutary enactments in this public statute.

228. Then you consider the appointment of an annual chairman not only illegal but decidedly injurious?—Most undoubtedly. This public statute received the Royal assent the 28th of June, 1833; it declares that the laws of sewers are in many respects defective, that doubts have arisen as to the extent of the powers given to Commissioners of Sewers, particularly as to the legal mode of conducting inquiries by juries; also as to the legal power to order new works; and further it authorizes the borrowing of money for such works; and distributing the costs and charges fairly and equitably among the parties who receive benefit or avoid damage by such works. Next it raises the amount of qualification of Commissioners of Sewers, and requires that each Commissioner before he acts shall swear as to the nature and locality of that qualification. It also regulates the meetings of Commissioners of Sewers, and enacts that at every meeting a chairman shall be appointed by the majority of Commissioners present. It regulates the inquiries by juries, and declares that they shall be sworn in open Court before the Commissioners, and shall proceed in their inquiry, before and in the presence of the Court, by receiving evidence upon oath, and subject to the same rules of taking and receiving evidence, as is usual in the Courts of common law. It authorizes all fines, forfeitures, and penalties, to be received in aid of the expenditure. I consider the advantages to the rate-payers of Westminster would have been very great under this Act: all of these they have lost by the Commissioners considering themselves exempt from the operation of that general statute, owing to the 61st section.

229. Have the Commissioners ever tried to obtain the power to elect a chairman?—Yes, and also to pay him a salary; as the following extract from a Bill preceding the local Act of 1812 will detail.

*“ Court, 3rd January, 1812.*

“And whereas, in consequence of the prodigious increase of buildings within the limits of the said Commission, the necessary business of the said



Commissioners has of late become so extensive, and the duties of the chairman so laborious, that it is with much difficulty a person properly qualified to fill the station can be found, willing to give up so great a portion of his time, as the despatch of business of the said Commissioners necessarily requires, without his having some remuneration for the same; and therefore it is expedient that a chairman of their Court should be appointed with a sufficient salary.

“Be it therefore enacted, that it shall be lawful for the Commissioners for the time being for the limits aforesaid, at the special Court to be held for that purpose as soon as conveniently may be after the passing of this Act, to appoint any one of the said Commissioners of Sewers for the limits aforesaid, to be the chairman of the said Commission, removeable at the discretion of the Court of Sewers, and shall assign him out of the rates, taxes, lots, and wains before mentioned, a competent salary, not exceeding the annual sum of £., payable quarterly; and a chairman shall be in like manner elected annually, but removeable as before mentioned.”

230. What became of this clause in the Bill?—I found the following charge in the solicitor’s bill, which explains the matter, “1812, March 13th.—Attending meeting of the Committee at the Swan Tavern, Westminster Bridge, in consultation as to the prudence of abandoning the clause for electing the chairman, when Mr. Lewis, and others, agreed on a different clause being introduced.”

231. Do you know whether the works under the Commission of Sewers for Westminster are done under contract?—Yes; at present a rather stringent contract exists; but I am of opinion the stringent stipulations of the contract are evaded.

232. Have the works generally been done under contracts?—It is so understood; but as I have given notice of motion in our Court to terminate the existing contracts, I have been induced to look closely into the subject, and my investigation led me to obtain a return of all the contractors, and the amounts paid to them during the last 63 years, and I find the following results, a gross charge of 620,451*l.* 4*s.* 1*d.*, by the following contractors.

1780	}	R. Holland.	1822	}	Bennett and Hunt.
to			to		
1800	}	Holland and Rowles.	1830	}	G. and W. Bird.
1800			1831		
to	}	G. W. and S. Bird.	to	}	Bennett and Hunt.
1811			1836		
1810	}	J. and W. Bennett.	1837	}	G. Bird.
to			to		
1823	}		1843	}	

Total 620,451*l.* 4*s.* 1*d.*

233. Will you present the return itself?—Certainly. (*The Witness handed in the paper.*)

234. The contracts, for the long period of 63 years, appear to have been in very few hands. Do you know if any of these contractors were Commissioners of Sewers?—I have every reason to believe for nearly the first half of the period they were.

235. What are the circumstances which induce you to think so?—Because, in investigating the subject, I found a direct charge brought before the Court of Sewers, in 1772, in the form of a petition, which

proves the point, and moreover connects the name of the Commissioner, who had induced the Court to appoint his son to do the works in the manner therein stated, with the subsequent contracts, which I have previously detailed to this Commission.

236. Have you a copy of the petition?—I have, and this is it. (*The petition was handed in.*)

237. We observe the name of Holland, together with the addition of his partner, Rowles, from 1780 down to 1811; do you know if they were Commissioners?—Most undoubtedly. I should have gone further back with this inquiry, for I found the name of Holland connected with the works even prior to the date of the petition; but the accounts have so many erasures; indeed one ledger is labelled erroneous, so that no dependence can be placed on them.

238. Does the Court appear to have taken any steps to prevent the appointment of contractors, who were also at the same time Commissioners?—After the first division of the large outlay on the open portion of the King's Scholar Pond sewer which I have detailed to this Commission, and after the expenditure on the purchase and repair of the Sewers Office, in both of which Commissioners who had a personal or family interest in the expenditure were concerned, a virtuous fit of indignation seems to have been felt, as the following extracts from the Court minutes, in 1813, will show.

*“Sewers Office }  
for Westminster, &c.”*

“RESOLVED, that it appears to this Court to be expedient, in conformity with the oath of office, and in order to enable each individual Commissioner to execute the authority given to him under the Commission truly and indifferently, and without favour or affection towards any one; and it is Resolved, that no person being a Commissioner of this Court of Sewers, nor any person related to a Commissioner, of and within the second degree, either by birth or marriage, (uncle and nephew being here deemed to be related to each other in the second degree,) nor any person connected with a Commissioner by co-partnership in any business or concern, shall hereafter be appointed, or continue to hold any office, or place of profit or emolument, under the Commissioners of this Court, or be allowed to furnish any article, or do any business under the Commissioners, for which the money appertaining to sewers is to be paid, except in cases where the Commissioners are under the necessity of employing any such person by reason of his being the contractor under another Board; and except in cases where an opinion only is to be taken on a specified object.

“And also, *that this resolution is not to take effect in regard to any relationship which may exist between a present Commissioner and any Officer now in the service of the Commissioners.*”

239. Are there any of the Commissioners who were in the Commission of 1806 at present acting under the existing Commission?—Several: indeed, it appears to be a sort of hereditary right in several families, as the grandfathers, fathers, sons, uncles, nephews, brothers-in-law, &c., find their way into the Commissions; and although the contractors cannot now be Commissioners, we find their relations and connections among them.

240. There is a bye-law of the existing Commission for Westminster at page 12, excluding any Commissioner, or any person related to a Commissioner, of and within the second degree, either by birth or



marriage, from being employed, or allowed to furnish any article, or do any business for which the money appertaining to sewers is to be paid?—Oh yes, there is such a bye-law, and it is now subjected to a very severe test. Among the 24 names recently added to the Westminster Commission are a considerable number of architects or surveyors, agents and solicitors; I ascertained that one of them, who is an architect or surveyor, is the brother-in-law of Mr. Bennett, one of the contractors. In open Court I ascertained the fact from the contractor I have named; I called his attention, and the attention of the Court to the matter, and the result declared was that as Henry Arthur Hunt, Esq., the Commissioner alluded to had not taken the oath of office, the brother-in-law contractor might continue as usual, whereupon I immediately warned Mr. Bennett, the contractor, of the consequences.

241. Are you aware of the manner in which Commissioners' names were recommended for insertion in new Commissions?—The Court gets up a petition to the Lord Chancellor, with a list of names for a new Commission, at the head of which appears a long list, comprising the names of the nobility and eminent persons, the majority of whom, probably 19 out of 20, never qualify; but the acting Commissioners nominate their relatives and friends. I present an extract from the records of the Court, which will show the course of procedure prior to the commissions of 1806, 1816, 1826, and 1830.\*

242. In what form are the contracts drawn up, and in what way are the prices calculated?—The two following papers will show the quiet and easy manner by which Commissioners, who, being contractors for the works, obtained an increase of prices. The first paper relates to brick work, &c. &c.; the second, to the price of timber and deals, by which a sliding-scale was introduced and continued to the present time, by means of which, the lower the price put in the contract, as the foundation of the prices therein stated, the larger will be the amount paid to such contractor. The plan seems by this latter paper to have originated with the Commissioner-contractor, and to have been approved by Mr. Saunders, the architect, or surveyor-chairman. (*The papers were handed in.*)

243. Does that practice still continue?—Oh yes, as far as it relates to timber and deals.

244. To the present time?—Yes.

245. Will you explain to this Commission how the lower the tender of the contractor is the larger the amount he will receive?—Certainly; the contract requires that the prices of each item shall be stated, but it contains the following *nota bene*:—

“The merchant's prices for fir timber and deals to be stated upon which the tender for those articles is calculated.

“To be allowed, for every 5s. advanced on the merchant's prices for fir timber,  $1\frac{1}{2}d$  per foot cube.

“To be allowed, for every 20s. advanced on the merchant's prices in deals per hundred,  $2d$ . for each 12 feet 3-inch deal.

“The prices of timber and deals to be reduced in the same proportion upon any decrease of the merchant's prices.”

The present contracts, from which I have extracted the preceding

\* See page 166.

plan, give the prices for fir timber and deals. Fir timber:—Bennett's, 5*l.*; Bird's, 5*l.* 2*s.* Deals per 100:—Bennett's, 27*l.*; Bird's, 25*l.* 10*s.* Both these contracts commenced at Michaelmas 1841, and in the bills for the first quarter's work to each contractor, 5*l.* 15*s.* per load was allowed as the standard for timber, and 30*l.* per 100 deals; consequently, the lower the estimate the greater would be the increase of the market price upon which he would be paid. For example,—take the deals, Bennett's, 27*l.*; Bird's, 25*l.* 10*s.*; merchant's price, 30*l.* Each contractor being entitled to an advance of 16*s.* 8*d.* on every 20*s.* difference between his offer and the merchant's price, Bennett would receive 29*l.* 10*s.*, while Bird would get 28*l.* 16*s.* 8*d.*; a difference of 13*s.* 4*d.* only per 100 deals, instead of 1*l.* 10*s.*, as offered in the contract. Thus, the difference in the amount of the tender is quite a deception on those who are unacquainted with the operation of the system. The sums actually paid differ but slightly. The account would stand as follows:—

Sums tendered.				Sums actually paid.			
	£.	s.	d.		£.	s.	d.
Bennett .	27	0	0	{to receive three times 2 <i>d.</i> on each of 100 deals . }	=2	10	0
Bird . .	25	10	0	{to receive four times 2 <i>d.</i> on each of 100 deals . }	=3	6	8
				Total .	29	10	0
				Total .	28	16	8
<hr/>				<hr/>			
Difference in tender }	1	10	0	Difference paid . 0 13 4*			

\* The following letter has been received in explanation of the statement relating to this system of making contracts:—

SIR,

60, Conduit Street, April 24, 1845.

ON perusing the evidence given by me before the Commissioners for inquiring into the Health of Towns, of which I lately received a printed copy, I find that some error, either clerical or typographical, has occurred in the answer to No. 245, which has caused a confusion in the latter part of the answer, and renders unintelligible the fact that the lower the merchant's price for timber and deals was stated by the contractor in the contract, the higher would be the amount paid to him under the plan adopted in the Westminster Court of Sewers since 1808.

I observe also, that in detailing the extraordinary system in my answer to Question No. 242, the paper explanatory thereof which I handed in to the Commission has unfortunately not been printed. To supply the omission and correct the error I will recapitulate the plan.

Parties desirous of contracting were, in 1841, required to tender among other items for the supply of "Yellow second deals," 12 feet long, 9 inches wide, 3 inches thick, being 9 superficial feet in each deal, equal to 1080 superficial feet in a "hundred" of deals (120). They were required to state what they would supply at per foot, and to insert their own statement of the merchant's price of the article they were to supply.

Bennett obtained the contracts for two divisions; and Bird the other two; each was to supply at 6*d.* per foot. Bennett's statement of the merchant's price per hundred was 27*l.*, and Bird's 25*l.* 10*s.*, and the latter, by the operation of the sliding scale, obtained, in actual payment, the highest price per foot, as I shall presently show from the records of the Court.

The chief surveyor sent every quarter to one of the Commissioners, a timber merchant, a table for him to fill in his monthly prices of certain articles therein stated, at which he was selling these articles at a credit price to the trade, among which was "White Christiana Second Deals;" on the return of this table of prices, which appear to vary from 30*l.* to 26*l.*, the chief surveyor calculated the price to be allowed the contractors. I now append the prices paid to each of the contractors in every quarter of the contract commencing at Michaelmas 1841, ending Christmas 1844.



246. How was the standard price for timber and deals obtained?—Until the last few months by the surveyor applying to one of the Commissioners, who was a timber-merchant, to give the price.

247. If the work had been executed, not by contract in the present mode, but by responsible officers, under the Commissioners, do you conceive that the works would have been better or worse done than they now are?—I am not able to answer the question. I think the present system is open to great improvement, and I incline to the belief that it is very injurious to the public interest to have standing contracts.

248. From your experience in attending their Court, what is the nature of the alteration you would suggest?—It requires a great deal of consideration to answer that; the most important information I should require would be an Ordnance Survey of the entire of the metropolis.

PAID TO BENNETT.						PAID TO BIRD.							
		Per Foot.	Per Hundred.						Per Foot.	Per Hundred.			
		d.	£.	s.	d.		d.	£.	s.	d.			
1st Quarter		6 $\frac{3}{4}$	=	30	7	6	7 $\frac{1}{2}$	=	33	15	0		
2nd	"	6 $\frac{3}{4}$	=	30	7	6	7 $\frac{1}{2}$	=	33	15	0		
3rd	"	6 $\frac{1}{2}$	=	29	5	0	None supplied.						
4th	"	6 $\frac{1}{2}$	=	29	5	0	7 $\frac{1}{4}$	=	32	12	6		
5th	"	6	=	27	0	0	6 $\frac{1}{2}$	=	29	5	0		
6th	"	*7	=	31	10	0	6 $\frac{3}{4}$	=	30	7	6		
7th	"	*7	=	31	10	0	6 $\frac{3}{4}$	=	30	7	6		
8th	"	*7	=	31	10	0	6 $\frac{3}{4}$	=	30	7	6		
9th	"	6 $\frac{1}{2}$	=	29	5	0	7 $\frac{1}{2}$	=	33	15	0		
10th	"	6 $\frac{1}{2}$	=	29	5	0	None supplied.						
11th	"	6 $\frac{1}{2}$	=	29	5	0	7 $\frac{1}{2}$	=	33	15	0		
12th	"	6 $\frac{1}{2}$	=	29	5	0	None supplied.						
13th	"	6 $\frac{1}{2}$	=	29	5	0	None supplied.						

It will be seen that the immediate effect of the sliding scale in the first quarter was to give the contractor who inserted 25*l.* 10*s.* in his contract an increase of 25 per cent., while the other contractor who inserted 27*l.* per hundred, only obtained an increase of 12 $\frac{1}{2}$  per cent. Further, it will be seen that in no one quarter did Bird supply at his contract price of 6*d.* per foot, and in only one of the 13 quarters did Bennett supply at 6*d.* per foot. The three quarters marked with an asterisk are overcharges allowed and paid to Bennett, to which I have recently directed the attention of the Court of Sewers, as yet without effect.

I am happy to add that the sliding scale is struck out of the contracts of the present year, and a fixed sum of 5*d.* per foot, equal to 22*l.* 10*s.* per hundred, is now paying.

If it be the intention of the Commissioners to publish an octavo edition of the Second Report, may I request the favour of their causing an insertion of this explanatory letter.

Henry Hobhouse, Esq.  
&c. &c. &c.

I am, Sir,  
Your obedient Servant,  
JOHN LESLIE.

## APPENDIX.

## “ SEWERS, WESTMINSTER, &amp;c.

*Statement of Proceedings usually adopted upon Applications for the Renewal of Commissions.*

## “ NEW COMMISSIONS, 1806.

“ The Court, taking into their consideration that the Commission under the Great Seal under which they act will expire on the 13th day of April next, and that under the Seal of the Duchy of Lancaster on the 2nd day of June next :

“ ORDERED, that a Special Court be summoned for Friday the 21st day of March next, and that the clerk do prepare, and lay before that Court for signature, a petition in the usual form for new Commissions; and that he do wait on the Marquis of Titchfield, the lord lieutenant of the county of Middlesex, requesting his lordship to sign the same.

“ ORDERED, that notice be given in the summonses for the said Court, that the petition will be then presented for signature, *and that the names of new Commissioners will be then proposed.*

“ The clerk reported that, in obedience to the order of the last Court, he had transmitted to the Marquis of Titchfield, lord lieutenant of the county of Middlesex, then at Welbeck Ollerton, in Nottinghamshire, the petition for new Commissions, together with an extract from the orders of the Court relating thereto, and that his Lordship had returned the petition, having signed it.

“ The clerk laid the petition before the Court, when it was signed by the Commissioners present, and the following persons were recommended as proper to be nominated in the new Commissions, in addition to those now remaining whose names are in the existing Commissions.

(Here follow the names of proposed Commissioners.—Between 70 and 80 names added.)

“ ORDERED, that a copy of the petition be entered in the Court book after the orders of the day.

“ The said Commissions under the great seal, and the seal of the Duchy of Lancaster, were read, and all the Commissioners present were sworn.

## “ NEW COMMISSIONS, 1816.

“ The Court having inspected their Commissions, and observed that under the Great Seal of the United Kingdom will expire on the 29th of March next, and that under the Seal of the Duchy of Lancaster on the 28th April following :

“ ORDERED, that the clerk do prepare, in the usual form, a petition for new Commissions.

“ ORDERED, that a special meeting of the Court be summoned for Friday next, the 26th instant, at One o'clock in the afternoon, the Court to be kept open until Four o'clock in the afternoon of the same day, *for the purpose of forming a list of names to accompany the petition for new Commissions*; and that notice thereof be given in the summonses for that meeting of the Court, and that *each Commissioner present at the Court will be requested to give in the names, residence, and description of any two gentlemen whom he may be desirous of nominating.*

“ ORDERED, that *no name be added by any individual Commissioner to the list which is to accompany the petition after the adjournment of the said meeting of the 26th instant.*



“ ORDERED, that a special meeting of the Court be summoned for Friday, the 9th of February next, and that the list of names proposed for the new Commissions be on that day submitted, in order to its being finally settled, to the end that such names as may be approved by the Court may accompany the petition for the Commissions.

“ ORDERED, that the clerk do immediately, after the meeting of the Court on the 9th of February, apply to his Grace the Duke of Portland, the lord lieutenant of the county, requesting his signature to the petition for new Commissions.

“ ORDERED, if the signature of the Lord Lieutenant of the county can be obtained in due time, that the petition be laid before the Court at its ordinary meeting on the 16th of February, for the purpose of its being signed by the Commissioners present; but if the Lord Lieutenant's signature cannot be procured in due time for that Court, that the chairman be, in that case, requested to call a special meeting of the Court to sign the petition, as soon as it may conveniently be done.

“ The Court nominated the several persons undermentioned as proper to be included in the list of names which is to accompany the petition for new Commissions, in addition to the names of those Commissioners who were nominated in the present Commissions, and are known to be still in existence.

(Here follow the names of proposed Commissioners.—30 noblemen, &c. and 110 others.)

“ The several Commissioners present in Court *then nominated each two persons for the approbation of the Court*, to be recommended for Commissioners in the list to accompany the petition.

“ Ordered, that the said recommendation be taken into consideration at the special meeting of the Court, which is appointed to be held on the 9th of February next.

“ Upon a consideration of the several names which the Court resolved, on the 26th ultimo, to include in the list to accompany the petition, IT WAS ORDERED, that the following name should be added to the said list,—viz. :

“ W. Hamilton, of Stanley House, Chelsea, Esq.

“ ORDERED, upon a consideration of the names submitted to the Court on the 26th of January last by the individual Commissioners then present, that the following names be included in the list which is to accompany the petition.

(Here follow the nominations of individual Commissioners.—99 names.)

“ ORDERED, that the clerk do forthwith prepare the petition, and complete the list which is proposed to accompany it, and make application to the Duke of Portland, the lord lieutenant of the county, for his signature thereto, and lay the same before the Court at the first meeting which shall occur after the petition shall have been signed by his Grace.

“ The clerk reported that, in pursuance of the order of Court of the 19th of January last, he had prepared a petition for new Commissions, and having, immediately after the meeting of the Court on the 9th instant, applied to the Duke of Portland, the lord lieutenant of the county, for his signature, he had obtained his Grace's signature; and having this day laid the petition before the Court, it was signed by the Commissioners therein mentioned in the form following,—viz. :

(Here follows the Petition, &c.)

“ New Commissions opened and read.

## "NEW COMMISSIONS, 1826.

"The Chairman having apprized the Court that the term of the duration of the Commissions under which they act was about to expire, viz., that under the Great Seal of the United Kingdom on the 19th of February, 1826, and that under the Seal of the Duchy of Lancaster on the 6th day of March following, ORDERED, that the Clerk do prepare, in the usual form, a Petition for new Commissions.

"ORDERED, that a Special Meeting of the Court be summoned for Tuesday the 3rd of January next, at Twelve o'clock at noon, the Court to be kept open until Four o'clock in the afternoon of that day, for the purpose of forming a list of names to accompany the Petition for new Commissions; that notice thereof be given in the summonses for that meeting of the Court; and that *each Commissioner* present at the Court be requested to *give in the name*, residence, and description of *any one gentleman* whom he may be desirous of nominating; at the same time it is recommended that no gentleman may be nominated who does not reside within the district described in the Commissions.

"ORDERED, that no name be added by any individual Commissioner to the list which is to accompany the petition after the adjournment of the said meeting on the 3rd of January next.

"ORDERED, that a special meeting of the Court be summoned for Friday the 13th January next, and that the list of the names proposed for the new Commissions be on that day submitted, in order to its being finally settled, to the end that such names as may be approved by the Court may accompany the petition for the Commissions.

"The Chairman stated to the Court the mode of proceeding, which had been laid down by the Court on the 16th December last, to be followed in the proposed application for new Commissions.

"The Chairman having then laid before the Court a letter which he had received from the Lord Bishop of London, nominating Thomas H. Budd, of Bedford-row, London, Gentleman, as a fit person to be named in the new Commissions of Sewers; RESOLVED, that his Lordship not being present in Court, his nomination cannot be received.

"Several of the *Commissioners present in Court, then nominated each one person* for the approbation of the Court, to be recommended as Commissioners in the list to accompany a petition for new Commissions.

"ORDERED, that the said recommendation be taken into consideration at the special meeting of the Court, which is appointed to be held on the 13th day of this month.

"RESOLVED, that there shall not be added to the proposed list any names, after the adjournment of the Court this day.

"The list of the gentlemen proposed being read from the chair, and a ballot being taken upon each respective name, it was decided that the following names should accompany the petition for new Commissions.

(Here follow 40 names.)

"ORDERED, that the clerk do forthwith complete the list, and lay the same before the Court on the 20th instant, *together with a petition in the usual form* for signature.

"The clerk presented this day, in pursuance of the order of the Court on the 13th instant, a petition in the usual form for new Commissions, together with the list of names proposed to accompany the petition, and the said petition having been read, and signed by the Commissioners present in Court; ORDERED, that the clerk do forthwith present the same, and that a copy of the petition and the list be entered after the proceedings of this day.

(Copy of Petition.)



“ NEW COMMISSIONS, 1830.

“ ORDERED, in consequence of the accession of His Majesty King William the Fourth to the throne of these Realms, that steps be taken to obtain a renewal of the Commissions of Sewers (for the city and liberty of Westminster, and such parts of the county of Middlesex as are usually included therewith), and that the same may be directed to such of the Commissioners named in the Commission of 1826, as are known to be now surviving, and none others; and the clerk do ascertain, and report at the next meeting of the Court, what are the steps proper to be taken for obtaining such renewal.

“ The Court having on the 6th of this month directed, that in consequence of the accession of His Majesty King William the Fourth to the throne of these realms, the proper steps should be taken to obtain a renewal of the Commissions of Sewers, and that the clerk should report what are the steps proper to be taken for obtaining such renewal; the clerk this day reported, that having made inquiry, he had learned that it would be necessary that petitions should be presented for new Commissions, in the same manner as is usual upon the expiration of the Commissions; when it was ORDERED that a petition should be prepared accordingly.

“ And a petition having been prepared and submitted to the Court, was approved and signed by the Commissioners present in Court.

“ ORDERED, that a copy of the petition, and of the list which accompanied it, be entered after the minutes of this day.”

(Copy of Petition.)

249. This Commission understands that a large work on the Ranelagh main line of sewer recently erected near the Bayswater-road has become in a ruinous state?—So much so that it requires an almost entire reconstruction.

250. Can you give any detail of the circumstances connected with this affair?—The Ranelagh main line of sewer, from the north side of the Uxbridge-road to the Bishop's-road, was an open sewer. As the Commissioners say they cannot do new works (which the Act of Parliament 3 and 4 Wm. IV. c. 22, from which they think themselves exempt, authorizes to be done under certain limitations), the Westminster Commissioners, in my opinion, evade the statute by making what they call a diversion of the old line. In this particular instance, the following outline will show the proceedings. To effect this diversion of the open ditch sewer in part only, the surveyors reported that a new sewer, 10 feet wide and 8 feet 6 inches high in the clear, with side walls two bricks thick, would be requisite, the length being 2,600 feet, at 3*l.* per foot lineal—7,800*l.*; that out of this amount there might probably be received from the builders 2,600*l.*, leaving 5,200*l.* to be borne by the district. William Ponsford, a great speculating builder on that estate, had previously petitioned the Court to allow him, at his own expense, to build 300 feet of 3 feet sewer along this new street whereon he was about to erect new houses. The Court refused his petition; but it was arranged that he should pay into Court 1*l.* a-foot, the estimated expense of the sewer he prayed leave to erect, and in such case the Court would undertake to divert the sewer up the new street he was about to make, the district to pay the remainder of the expense of the 10 feet sewer.

On the 3rd of May, 1839, the Court ordered an expenditure of 1410*l.* for the commencement of this diversion, upon William Ponsford, the builder, contributing 300*l.*: this was carried by nine votes against seven.

On the 17th May this order was confirmed, and the clerk, after the order for the expenditure of 1410*l.*, and the confirmation thereof, was ordered to inquire if the freeholders on the banks would contribute: and on the 7th June the clerk reported that the freeholders declined to contribute.

This work was reported to have commenced on the 12th September, 1839, and to have been finished 1st January, 1840, subsequently explained to be a clerical error, and should be 1st February, 1840; and that 468 feet 9 inches was then executed, at a cost of 1444*l.* 8*s.* 7*d.*, about 3*l.* 1*s.* 7½*d.* per foot lineal.

251. Was this work done under contract? and if so, by whom?—Under contract by George Bird, junior; but I am of opinion that the stringent clauses in the contract were in this instance, as in others, evaded.

252. Will you explain to this Commission the points in the contract which you think were evaded?—The contract contains this condition: “The contractor is to deliver to the Commissioners, at their office, on the second day after the work is done, duplicate daily vouchers or accounts in writing of all works done, specifying the quantity and admeasurement thereof, upon a printed form to be furnished by the Commissioners.” Consequently, if the report be true that this work was finished 1st February, 1840, the duplicate voucher from the contractor ought to have been presented with the admeasurement, at latest, on the 3rd of February, 1840. Now I find that the chairman and Mr. Dowley, the chief surveyor, visited this work on the 27th January, 1840; that the chairman complained of the work; and that on the 1st February, the day the work is reported as completed, I find Mr. Dowley again on the works, and the observation entered, “Taking down the walls thrown over by the ground.”

But the most extraordinary violation of the contract is, that this work, reported to have been finished on the 1st February, 1840, was not actually measured until the 12th May. Although Mr. Bird, the contractor, contrived to charge the Commissioners for this work as follows, which I have extracted from his accounts—

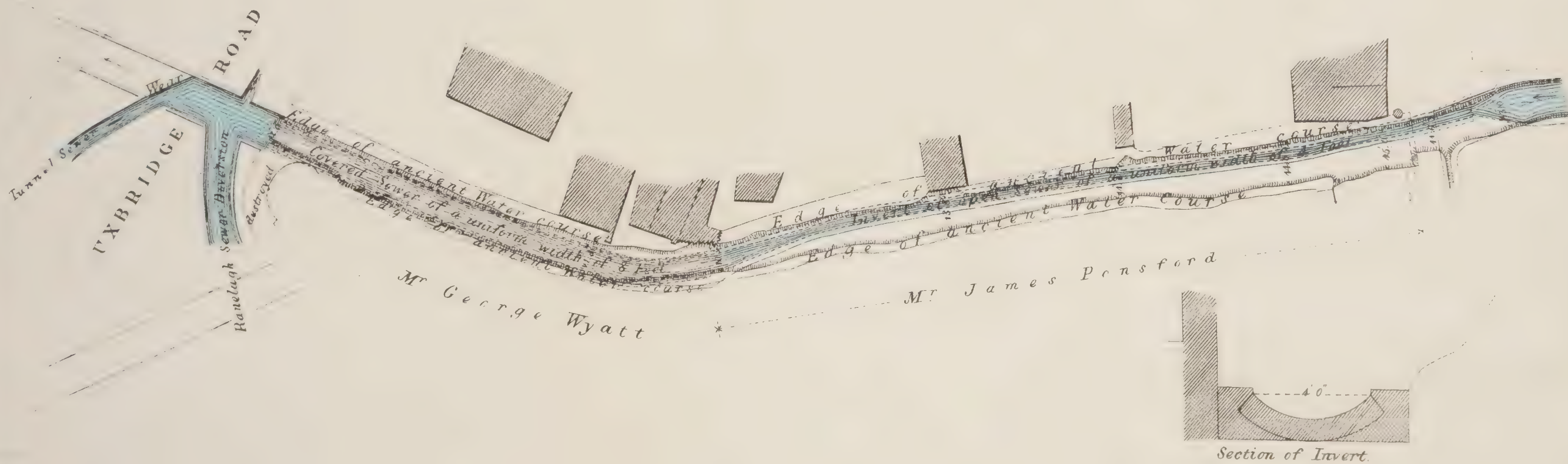
Quarter ending Christmas, 1839.			
December 22 to 25.—Diversion of main line from Uxbridge-road, 400 feet run of 10 feet sewer, as per estimate, at 3 <i>l.</i> a-foot . . . . .			
			£. s. d.
			1,200 0 0
Quarter ending Lady-day, 1840.			
March 25.—Ranelagh main sewer—			
4,037½ yards digging, 1 <i>s.</i> 9 <i>d.</i> . . . .	353	5	7½
22,769 feet reduced brickwork, 12 <i>l.</i> . .	1,046	7	4½
234-6 ditto in cement . . . . .	13	15	10½
			1,413 8 10
Deduct by amount charged in Christmas Quarter .	1,200	0	0
			213 8 10½

There are other points in the contract which, on the best evidence I can obtain, have been evaded. One of the conditions is, that “all the



# RANELACH SEWER, BAYSWATER.

Plan shewing course of Original line of Open Sewer, and, in Dotted lines, the Covered Sewer, and Invert lately built therein.



Scale of Feet  
100 80 60 40 20 0





works hereinafter mentioned are to be done with the very best materials, and in the most perfect and workmanlike manner." Another is, "that the brickwork to be in every respect of the best workmanship, no four courses to rise more than 12 inches, the cross joints to be well flushed up, and the arches grouted." There is very strong evidence that the work has not been done in the most perfect and workmanlike manner, that the four courses of brick do rise more than 12 inches, and that there is a great excess of mortar, particularly in the arch.

253. When was the failure in the sewer discovered?—I believe it was known to the officers some time before the Court was made acquainted with the disagreeable fact. It came before the Court on the 3rd of May, when a Special Court was appointed to be held on the 14th of May to inquire as to the failure of the works; at which meeting, being anxious to elicit the whole truth, I gave notice of motion, which was discussed on the 17th of May, 1844. The following extract from the Court minutes will show the object and the result of my motion:—

"SEWERS OFFICE FOR WESTMINSTER, &c.

"*Extract from the 'Orders of Court,' 17th May, 1844, vol. 45, p. 442.*

"MR. LESLIE then moved, pursuant to the notice given by him, That a Court of Sewers be held at the Crown Tavern in the Uxbridge-road, (on an early day,) and that the sheriff be required to summon a legal jury of sewers to attend the Court at that place; and that the jury take a view of the recently constructed main line of the Ranelagh sewer, and receive evidence upon oath as to the defaults therein, whether occasioned by design, construction, or superintendence.

"And Mr. Fuller having seconded the said motion, there appeared Ayes 3, Noes 13.

254. Were any of the 13 Commissioners who voted against an inquiry before a jury into the facts of the case either architects or surveyors?—Yes, six of the 13 were.

255. By your motion it appears that you would have submitted the whole question of the defaults in the sewer, whether as to design, construction, or superintendence, to a jury?—Most undoubtedly; the very terms of the statute, 23 Henry VIII., cap. 5. sec. 3, under which Commissioners of Sewers are issued, point out the course in these words:—

"Also to inquire by the oaths of the honest and lawful men of the shire where such defaults or annoyances be, as well within the libertie as without, (by whom the truth may the rather be known,) through whose default the said hurts and damages have happened." And the parties I intended and so stated to the Court to call before the jury were the Rev. Henry Moseley, of King's College, London, and General Pasley, men of the highest rank in science and above all suspicion. Subsequently a motion was carried to give the contractor notice to reinstate the work. At the following Court, he appeared by his solicitor, who after a lengthened verbal exculpatory statement, put in in writing an answer, of which the following is a copy:—

"That having executed my contract for the Ranelagh sewer in accordance with the plans and directions of your officers, I submit that I am not liable to reinstate the existing defects.

(Signed)

"To the Commissioners of Sewers for Westminster  
and part of Middlesex.

"G. BIRD, by  
"S. GARRARD."

On Tuesday, the 17th of June, the Court met again, each Commissioner in the interim having been supplied with a copy of a report from Mr. John Phillips, a new clerk of the works just appointed, whose statements had been impugned by Mr. Bird's solicitor at the previous Court. I present a copy of his report.\*

256. What was the result of the meeting of the Commissioners on the 17th of June?—The following extract from the Court minutes will give the information:—

“SEWERS.—CITY AND LIBERTY OF WESTMINSTER AND PART OF THE COUNTY OF MIDDLESEX.

“*Extract from the ‘Orders of Court,’ 18th June, 1844.*

“It was moved by Mr. John White, and seconded by Mr. Allason,—‘That the defective form of the sewer, the same having been built with high upright walls, unsupported by counterfoots or concrete backings, and with a flat segmental arch, has been the principal cause of the failure of the sewer, and for which the contractor is not responsible.’

“An amendment was then moved by Mr. Willoughby and seconded by Mr. Le Breton,—‘That the proceedings in this case be placed in the hands of our solicitors forthwith,’—when there appeared Ayes 16, Noes 8.”

257. Can you state the whole expense of this diversion of the sewer which is in such a perilous condition?—The first portion was built in 1839-40, the second in April and May 1842; the whole length executed in these two divisions was 1167 feet 9 inches, and the expense 3471*l.* 10*s.* 0 $\frac{1}{4}$ *d.*

258. Do you approve of the outlay, supposing the work to have been well done?—Certainly not. I consider the expenditure enormous; and because, almost to the whole extent of the diversion now executed, the original open main line is not thereby relieved; it must exist as a sewer to drain the houses on its bank, until another new sewer down Elms-lane is built. Therefore I think this diversion, as it is called, illegal, as well as not effecting the object of a diversion, viz. the improvement of the old line.

259. What has been done with the old line since the diversion you have been speaking about commenced?—Mr. George Wyatt, the architect, had a petition presented to the Court of Sewers, praying leave, 15 May, 1840, to build 160 feet of wall on the east side of the open sewer, to be the back front of a line of houses; whereupon the surveyors were ordered to report. On the 5th of June the petition was withdrawn, and instead, he asked permission to build 170 feet of sewer, 8 feet wide, in the line of the open sewer, which the Court granted.

260. What was the object of these two petitions?—To further the purpose of a building speculation; because the contraction of the sewer enabled Mr. Wyatt to build his houses so much wider than he could have done if the sewer had remained open. The extent of ground he gained, according to Mr. Dowley's statement to my inquiry, was, upon an average, six feet wide the whole length.

261. Then for 170 feet the old sewer is now contracted in width to 8 feet, and covered in, and Mr. Wyatt thereby gained 1020 square

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\* Sec, p. 179.



feet of land by his petition?—Exactly so ; and of incalculable value to his building speculation.

262. Has any further portion of the old line been covered in?—No. On the 4th June, 1841, Mr. Ponsford, the builder, prayed the Court to allow him to continue for 280 feet the sewer eight feet wide as built by Mr. Wyatt. The Court gave him permission, but the work was not done. On the 18th August, 1843, Ponsford renewed his petition. The Court ordered the surveyors to report ; after the report, Ponsford was allowed to build an invert four feet wide, provided he made a diversion higher up the sewer, northward, to join the diversion at the south end, to which I have before alluded, and by means of which the old line loses the flow of the upland waters ; and on the 5th January, 1844, the Court abandoned the old line to the proprietors on either side ; and the sewage of that ancient line, to the extent thus abandoned, can now only be relieved by another new sewer down Elms-lane, as I have before detailed. But the tracing will more clearly explain the whole affair, which has created so large an expenditure of the sewers-rates.

263. How far is this sewer from the one which, the Commissioners were informed, fell in in February, 1823, near Notting Hill?—They are a very considerable distance apart ; but there has been another failure of a sewer lately announced in the same district, built by the same contractor, and under the same clerk of the works. The annexed wood-cuts exhibit the sections of the three sewers that have lately broken in, and the forms that they assumed after the failure. Fig. 1 is the sewer at Notting Hill, built by a private individual, but under the inspection of the officers of the Court. Fig. 2 is the sewer just mentioned,

Fig. 1.

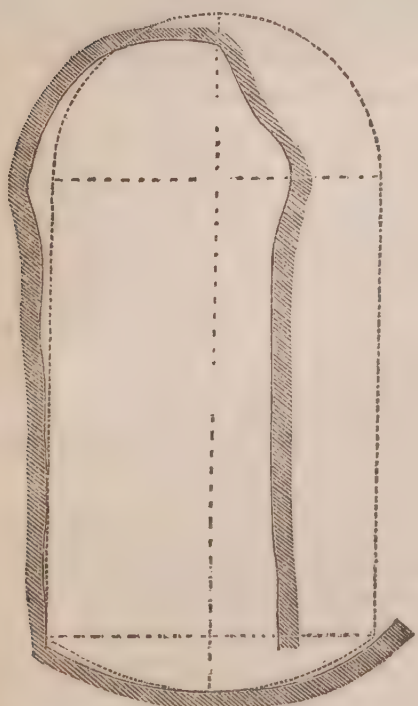
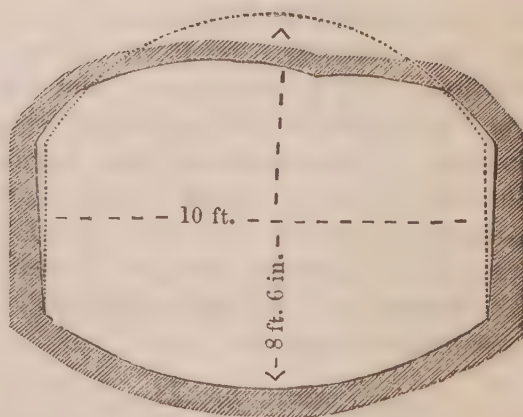


Fig. 2.



near the Uxbridge-road, as having cost 3*l.* a-foot. Figs. 3 and 4 are different views of one near the Harrow-road. Both of these last sewers were built by the contractors of the Court.

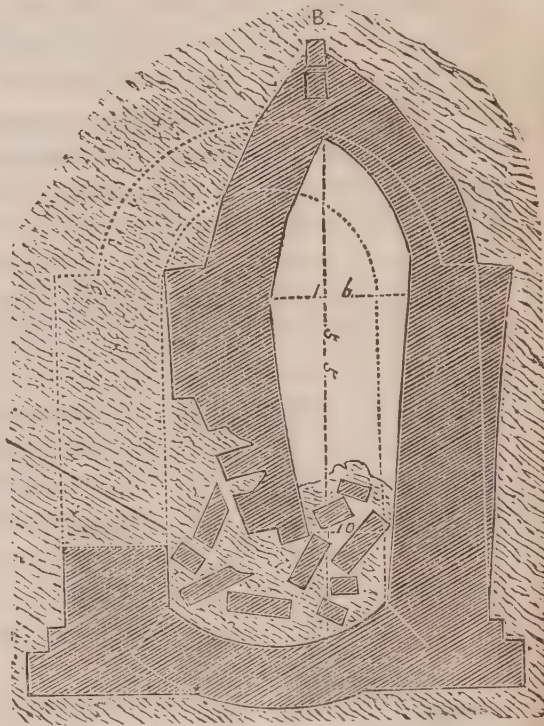
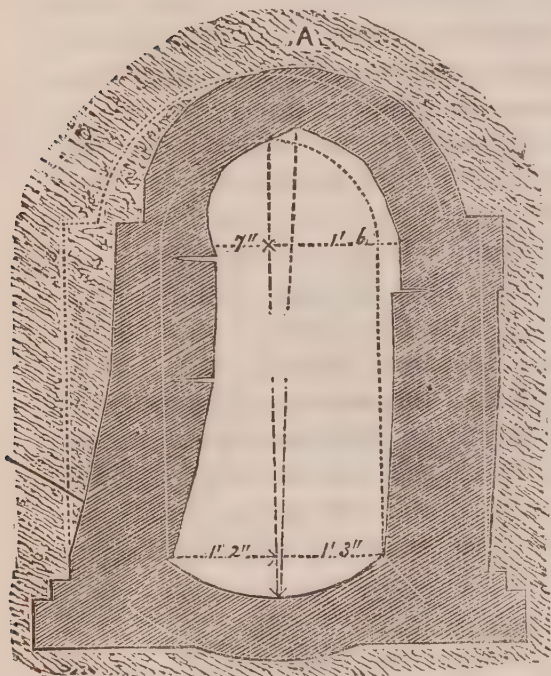
264. Can you supply this Commission with any particulars respecting

this additional failure in the works, under the Westminster Commission of Sewers?—I will endeavour to give an outline of the proceedings prior to the building of the sewer which has failed: I will then submit the expenditure thereon, and the probable expense of reinstating the works.

A report from the two surveyors, Messrs. Dowley and Doull, with a plan of the ground, was presented to the Court, 21st October, 1842, in which it was shown that 750 feet from the open line of the Ranelagh sewer, across a field to the Harrow-road, belonging to the Great

Fig. 3.

Fig. 4.



*The dotted lines show the regular form of the Sewers.*

Western Railway Company, the new covered sewer should be done by that Company, that from thence across the Harrow-road, and proceeding along a field at the west side of the Harrow-road, and under the Paddington Canal to its north bank, 800 feet, should be done at the expense of the district of the Ranelagh sewer, and a further length, marked on the plan, by the Governors of the Lock Hospital, at an estimated expense of 600*l*. The Court approved of this Report. On the 6th of January, 1843, a Committee of five was appointed to view the drainage of the Lock Hospital. And the following is the result of their proceedings:—

“ The Committee considered the report of the surveyors, and examined the plans and heard Mr. James Oliver of Desborough Lodge, Harrow-road, the party who complained of the nuisance occasioned by the offensive matter issuing from the Lock Hospital, and passing along an open drain by the side of the high-road; also, Mr. Hardwick, on behalf of the Great Western Railway Company, and Mr. Henry Abrahams, the agent of Mr. John Aldridge, the owner of certain property on the south side of the Harrow-road. They then proceeded to view the spot in question.

“ Resolved, that they recommend that the Court should assert its jurisdiction over the entire length of the sewer, from the point north-west of the canal, where it receives the drainage of the high-road; and are of opinion



that the neighbourhood must be protected against the nuisance complained of.

“Resolved, that this Committee find that the Lock Hospital has been surreptitiously and improperly drained into the said sewer, and that they recommend that such drainage be forthwith stopped; upon which the Committee divided, when there appeared,—Ayes 4, Noes 1.

“Resolved, that this Committee entirely approve the line proposed by the surveyors; but that they see no prospect at present of the property in the neighbourhood contributing towards the expense thereof.

265. We perceive that five Commissioners were present at this Committee on view; how many of them were surveyors, architects, or connected with building operations?—The whole were: four were architects or surveyors, and the fifth was, or is, a bricklayer. One of them sold a portion of his property on the spot to the Lock Hospital, another is the surveyor to the Great Western Railway, a third is the district surveyor, and also a surveyor connected with the Paddington estate and the lands of the Grand Junction Canal Company.

266. It appears, then, that several of the committee who approved of the line proposed by the surveyors to the Court of Sewers, and resolved that “they saw no prospect at present of the property in the neighbourhood contributing towards the expense thereof,” were connected with the property to be affected by this sewer?—Yes; several of these Commissioners on that Committee represented the greater portion of the property in that neighbourhood.

267. Were the works ultimately done according to the report of the surveyors?—Yes; according to the line proposed by them, but in defiance of their proposal for charging the expense upon the owners of the adjoining lands. The works through the field of the Great Western Railway Company were done at the expense of the rate-payers, without a farthing contribution from the Great Western Railway Company. The other works, also, were done at the public expense. These two portions cost 1,584*l.* 0*s.* 4*d.* I have got the details of the expense with me, if it is desired that they should be put in.

268. In which portion of this work has the failure occurred?—In the Harrow-road, near the Lock Hospital; and, according to the report of two of the surveyors, 240 feet will require to be reconstructed at an estimated expense of 360*l.* I submit to this Commission the report of the surveyors on the failure.\* The above wood-cuts (3 and 4) are taken from the drawing laid before the Court.

269. When you were last examined by this Commission, you stated that you had given a notice of motion to terminate the existing contracts under the Westminster Commission; did you carry that motion?—I did, and notice thereof was sent to the different contractors; and I followed that up by another notice of motion, the necessity of which I urged by the opinion I entertained that we were paying most exorbitantly; for the digging particularly. My motion on the 23rd of July was to this effect:—

“That the works (985 feet of sewer in Wellington-street North, Upper Wellington-street and Bow-street, estimated to cost 1400*l.* 9*s.*) on the eastern division of the Westminster sewers, be the subject of a

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\* See Appendix, p. 182.

special contract, after public advertisements, and that the excavation and the construction be separately tendered for."

I lost the motion by a majority of four; three voting for the motion, and seven against it.

270. Do you know what the estimated expenditure for digging amounted to?—In the whole line, occasioned principally for the new street, and for the purposes of the Holborn and Finsbury district, nearly 12*s.* per foot lineal; 1,672*l.* 2*s.* for 2,840 feet in length.

271. Have you taken any steps in consequence of losing your motion as to a special contract?—I have. I determined upon a thorough and complete sifting of the contracts, and the result is that I have detected a loss to the public of a very serious amount, arising from the mode in which the contracts in 1841 for the Eastern and Western divisions of the Westminster sewers were made.

272. Will you detail the course you adopted and the results of your investigations?—I will. I commenced by asking for the following returns from Bennett's accounts under the present contract:—

- 1st. The number of cubic yards of digging, at 2*s.*
- 2nd. The number of cubic yards of digging, at 1*s.* 8*d.*
- 3rd. The number of rods of brickwork.
- 4th. Ditto in blue lias.
- 5th. Ditto in cement.
- 6th. The number of thousands of brick, at 30*s.*

But finding that there was some little delay in getting them out, I went myself to the accounts and extracted the returns I wanted during the whole period since the commencement of the present contract, Michaelmas, 1841, eleven quarterly accounts to Midsummer, inclusive.

On inquiring with regard to the present general contracts for works, I was informed that the principal difference in the mode of obtaining these contracts and those of 1836 was this:—In 1836 prices only were sent in by the contractors, and the surveyors and clerks of the works instituted a comparison between them during the sitting of the court, by moneying them out at certain amounts, and the court then accepted that tender which proved to be the lowest. In 1841, however, I am told that it was suggested that much trouble would be saved by requiring the parties themselves to money out their tenders before sending them in, and that this was done by them accordingly before the meeting of the court to open the tenders.

273. Will you now explain the way in which the public has suffered?—Certainly. I speak only of the two divisions, the Eastern and Western, under the same contractor, Bennett. There were five tenders upon printed forms, with quantities supplied to the competitors, stating the amount of each description of work likely to be required. The sums are filled in by the persons contracting, and the amounts added up. They appeared as follows:—

	£.	s.	d.
Joseph Bennett . . . . .	4,986	8	2
G. W. and W. Bird, jun. . . . .	5,079	6	3
Stephen and Mary Bird . . . . .	5,409	15	5
W. Jackson. . . . .	5,268	19	2
Jonathan Riches . . . . .	5,274	5	5



Among the items were 350,000 "stock bricks equal to pattern." These Mr. Bennett put down at 30s. per thousand, 525*l*. He was, at the time he tendered, supplying the Commissioners under his existing contract with the same bricks at 2*l*. 2s. a thousand; the actual supply of bricks, instead of 350,000, being only 18,828. The next feature in the case is that a very much less quantity of digging was put down than was actually to be done, for in the form of tender given out to the competitor, 7450 cubic yards was inserted. The actual quantity done in the year was nearly five times as much, nearly 36,000 cubic yards, and this was charged at 2s. per cubic yard, being 3*d*. a yard above the next tender. Bennett was declared the lowest, and the public had to pay under the existing contract an excess over the next rejected offer on 29 different items, sums varying in amount from 100 per cent. downwards.

274. What is the whole amount of works done in the Eastern and Western divisions, under the existing contracts?—The eleven quarterly accounts of the existing contracts amount to 41,649*l*. 17s.

275. Then according to the tender for the four quarters, he should have supplied in the eleven quarters of the existing contract 962,500 bricks, at 30s. a thousand. Do you know how many he did supply?—In the whole period of the eleven quarters only 73,056.

276. Taking the same datum, he should have excavated 20,487 cubic yards; what was the real quantity?—More than four times as much; above 81,000 cubic yards.

277. So that while the public have gained about 30*l*. on the number of bricks used, they at the same time have lost above 1000*l*. on the digging?—Yes, those are about the sums upon those two items; but there are several other smaller items, of which I now give many of the details, upon which a loss has been incurred. It may altogether amount to about 1500*l*. It would be a work of very considerable labour to take out all the details; but the above calculations will afford the Commissioners some idea of the pecuniary loss from the carelessness (to say the least of it) with which these tenders and contracts were made.

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## APPENDIX.

### "SEWERS OF WESTMINSTER AND PART OF MIDDLESEX.

*"Report of Mr. John Phillips, Clerk of the Works to the Commissioners of Sewers for Westminster, &c., in substantiation of the Statements which he made as to the Failure of the Ranelagh Main Line of Sewer in Gloucester-road, Paddington.*

*"Sewers' Office, No. 1, Greek-street, Soho, 7th June, 1844.*

"THE statements that I made to the Court respecting the cause of failure of the Ranelagh sewer built along Gloucester-road, Paddington, having been impugned, I beg most respectfully to state that, after a careful and minute examination of the work of the said sewer, I am still further convinced of the accuracy of those statements, namely, that the cause of failure is wholly in consequence of the inefficient manner in which the brickwork, in conjunction with the groundwork, has been executed. Seeing the course

the question has taken, and believing my character is at stake in this affair, I beg to be allowed to state, that I am prepared to prove those assertions by facts.

“ In excavating for this sewer it appears that the ground was dug out somewhat wider than the sewer, including the side walls; so that after the side or abutment walls were built, a space of a few inches in width had to be filled in behind the walls with ground, which, if properly and soundly rammed down, would have been of sufficient solidity to have borne the lateral thrust of the arch, and the superincumbent weight of ground placed above it. The abutment walls are thrust outwards from their perpendicular position to the extent of  $3\frac{1}{2}$  inches or more, compressing the ground filled in behind them, which was not properly and soundly rammed, otherwise it would be next to impossible for the abutment to have gone outwards with the pressure to which they have been exposed: moreover, from the appearance of the ground taken out from behind the walls, it has not the tenacity and solidity that ground would have that had been well and soundly rammed.

“ As regards the brickwork of the arch of the crown of the sewer, I beg leave to reassert that it has been done in a slovenly and unworkmanlike manner; that no respect has been shown either to properly bonding the bricks together, or in regulating the courses of bricks with equal joints of mortar; for between some joints there is scarcely any mortar whatever, and between others the thickness of mortar varies up to one inch or more. The number of courses of bricks in the bottom half-brick ring of the arch are 50, and in some places there are only 49, which is three and four courses less than could and ought to have been got into the bottom ring of the arch; therefore, there are nearly nine inches in thickness of mortar in excess distributed over the arch of the sewer, where bricks ought to have been used instead. I would beg to call attention to the circumstance of one course of bricks being lost in the arch as before stated, a fact in itself evidencing a great want of attention in the execution. The bricks appear to be of good quality. The mortar used was made of Dorking lime and Thames sand, and is not so strong as I should have expected from the nature of these materials—it is in a very friable state, which I should say is caused by the admixture of more water with the lime and sand than was requisite, and too long exposure of the lime to the air; and, moreover, from its appearance, the lime and sand have not been thoroughly mixed. In the composition of mortar no more water should be used than is sufficient to bring it to a tough and proper consistency for using, otherwise it has the effect of destroying the strength of the lime to a considerable degree; and the lime should be used as soon as possible after it has been burnt, otherwise it reabsorbs the carbonic acid, which has been driven off during the process of calcination. Mortar after being used in a wall loses a considerable quantity of its bulk from evaporation and contraction, which causes the walls to shrink and settle; in consequence of this, as little mortar as possible should be used in building a wall, more especially in an arch. In the arch of this sewer, such an unusual quantity of mortar has been used in the joints, and that so irregularly, that it is sufficient in itself to cause a considerable settlement, and also a very great distortion in its form.

“ With respect to the abutment walls, the manner in which they have been built is contrary to the contract, which says, that ‘the brickwork shall be in every respect of the best workmanship, no four courses to rise more than 12 inches.’ There are 15 courses of bricks in the abutment instead of 16, as shown and described in the original drawing of the said sewer. Those 15 courses rise 3 feet  $10\frac{1}{2}$  inches, which is  $1\frac{1}{2}$  inch in excess over the instructions in the contract, for the like number of courses: this excess is caused by the joints of mortar being too large.

“ The average width of the sewer between the abutment walls as built



perpendicularly on the invert is 10 feet 3 inches, being 3 inches wider than that shown in the original drawing of the said sewer. Then the springing walls being only 3 feet  $10\frac{1}{2}$  inches high, it was necessary to elevate the centre  $1\frac{1}{2}$  inch above the springing wall, for the purpose of keeping the requisite height from the top of the centre of the invert to the under side of the arch, and in consequence of the increased width, and the  $1\frac{1}{2}$  inch less in height of the springing walls, the arch line is lengthened on each side, making the springing point  $1\frac{1}{2}$  inch below what it would have been had the walls been carried up to their intended height. This  $1\frac{1}{2}$  inch added to the versed sine of the arch in the original drawing, which is 2 feet 10 inches, will make the versed sine of the arch as built 2 feet  $11\frac{1}{2}$  inches. Then taking the chord line of the arch at 10 feet 3 inches, and the versed sine at 2 feet  $11\frac{1}{2}$  inches, I find the length of the arch line is 12 feet 4 inches, and 4-tenths, which divided by 53 courses of bricks, gives 2 inches and 8-tenths for each course including the joint of mortar; then for eight courses there would be 1 foot 10 inches and 4-tenths, and having measured eight of the bricks taken out of the arch after being cleansed of the [mortar, I find they measure 1 foot 9 inches, and 4-tenths. Therefore, taking this sewer as actually built with its increased width, 53 courses of brick could have got into the arch with ease, and then allowing ample joints for mortar, which would be a quarter of an inch in the centre of the half-brick ring. It is the usual practice in building brick arches for bridges, &c., to allow for each ring at its soffit 1 foot  $10\frac{1}{2}$  inches, to the utmost, for eight courses of bricks.

“I would beg to observe, that there is one section, No. 28, which shows the side walls in a perpendicular position; the arch is gone upwards on one side, and is come down on the other, that is, at the haunches, which, I should say, is caused by the thick and unequal joints of mortar being compressed or giving way with the weight of ground placed on the arch, as the ground could not possibly have had the effect of causing the distorted form there shown.

“Therefore, taking into account the inefficient manner in which the ground-work was executed, namely, the neglect to properly back up the abutment walls and spandrels of the arch with ground well and soundly rammed, and also the inferior and unworkmanlike manner in which the brickwork has been executed, more particularly in the arch, I am of opinion that the failure of the said sewer is entirely attributable to these causes.

(Signed) “JOHN PHILLIPS, *Clerk of the Works.*”

“COMMISSIONERS OF SEWERS FOR WESTMINSTER AND PART OF  
MIDDLESEX.

“*Sewers' Office for Westminster, &c., 12th July, 1844.*

“IN obedience to the order of the Committee on View on the 28th of the last month, to report on the failure of the sewer in the Harrow-road, Paddington, near to the Lock Hospital, we would observe that, with the view to prevent the mischief that would inevitably accrue to the neighbourhood by the waterway becoming totally blocked or stopped up by any sudden collapse or falling in of the said sewer, and also to enable us to form an opinion as to the causes of the failure, we have had the earth entirely removed from off the arch, as also chases cut through the side walls and invert, at the part where the brickwork assumed the most dangerous and alarming condition.

“Having carefully and minutely examined the work, and judging by the direction in which the fractures have taken place, as also from the nature of the ground through which the sewer is built, we are induced to conclude that the mischief is to be attributed to a combination of circumstances, more particularly to the slipping in of the ground on the eastern side of the sewer.

“ The first opinion we would express is, that due and timely precaution was not taken in securing the sides of the excavation at the time of building the sewer, and that there had been a tendency in the ground to slip previously to the completion of the work—in our minds fully indicated by the workmen not having ventured to take out the whole of the temporary cross struts, some of which still pass through each of the side walls.

“ We would next observe that the sides of the excavation, at the part where the greatest mischief has taken place, were cut to a depth of about 27 feet, and were of unequal height; added to which, the highest side (that on the east) has to sustain the weight of the main turnpike road, along which loaded waggons are constantly passing, necessarily causing considerable vibration, thereby increasing the natural disposition of the ground to move.

“ A third and serious evil has, in our opinion, arisen from the surface of the roadway being so formed, that whatever water might fall upon it would have a tendency to flow into the field over the sewer, and find a passage, by the upright planks left in upon the completion of the work, to the back of the springing wall.

“ To the injurious effect of this, combined with the causes before mentioned, the whole of the failure, as shown in the accompanying sections, may, in our opinion, be traced.

“ With reference to the materials with which the sewer has been constructed, we would state, that the bricks and mortar appear to be of good and proper quality, but that the workmanship generally, especially in the outer rim of the upper arch, is not so perfect as it ought to have been; nor are we at all satisfied that the ground was soundly and properly punned or rammed behind the side or springing walls. We would, however, beg most distinctly to state that, although much of the mischief might have been somewhat diminished by due and proper care in the execution of the work, yet the necessity for rebuilding the sewer, as occasioned by the failure, would not have been prevented.

“ Beneath, we beg to submit an estimate of what we imagine would be about the cost of reinstating the work, which we strongly recommend should be done with as little delay as possible, as, from the length and depth of ground now taken out, it would be impossible, in the event of much rain falling, to guarantee the security of the roadway.

“ The total length which, in our opinion, it will be necessary in part to take down and rebuild, in order to reinstate the sewer, is about 240 feet, the cost of which, including digging and strutting the ground, and rebuilding the defective arch and side walls with new materials, we estimate at about 360%.

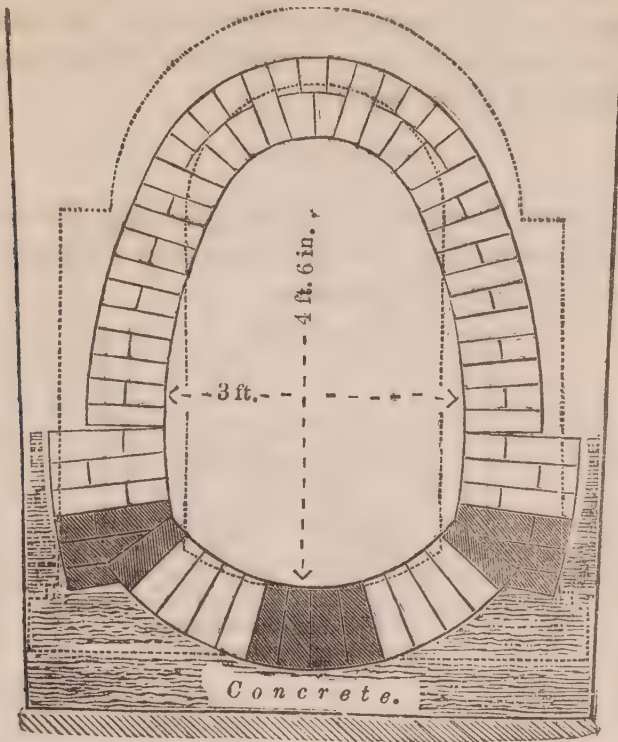
“ JOHN DOWLEY, *Surveyor.*

“ GEORGE HAWKINS, *Assistant Surveyor.*”

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NOTE.—The annexed woodcut shows the section of a new form of sewer ordered by the Court, September 27, 1844. The dotted lines denote the sectional form of sewer previously in use.—



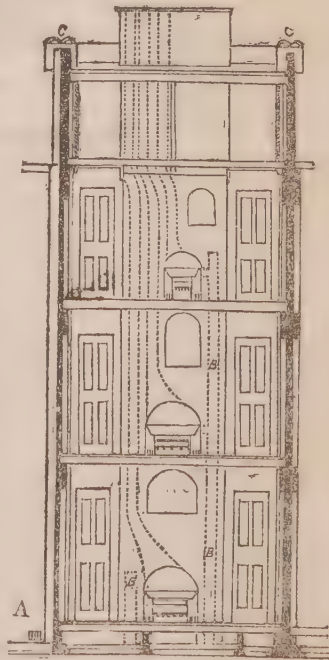
#### ILLUSTRATIONS OF SUGGESTED MODES OF VENTILATING DWELLINGS.

*Referred to in the Evidence given by William Hosking, Esq.,  
Architect.—First Report, Q. 296.*

**A.A.A.** Gratings and double air bricks admitting the external air underneath the ground-floor, which is laid on interrupted footings to allow a free circulation under the joists and sleepers.

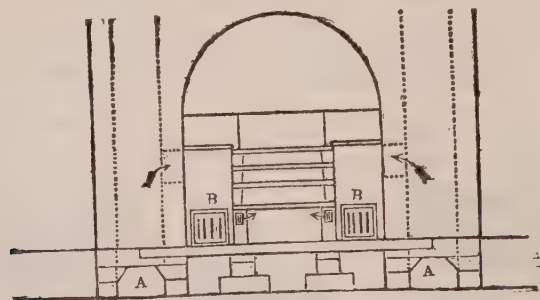
**B.B.B.** Flues by which the air is conducted from underneath the ground-floor to the backs and sides of the fire-places, and thence through slots in the cheeks of the grates to the rooms, and through small holes in the backs of the grates to feed the fires. It is presumed, that when a fire is burning in the grate it will occasion a draught through the perforations at the back, which will give a more complete combustion of the smoke than can be obtained when air is admitted to the fire from the front only. When the grate becomes heated it will warm the air at the sides, and cause it to enter the room through the slots; the room will thus be warmed with less expenditure of fuel than is required when the cold external air forces itself in to supply the fire.

**C.C.C.** Smaller air flues having openings at the ceiling level of the rooms intended to carry off heated and foul air. The room can have



no tendency to become close, as the unwholesome air will escape through these openings, and its place be supplied by air from the pure air flues, B. B., whether there is a fire or not. The openings into these flues are proposed to be formed over the tops of the closets in the recesses, and to be concealed by a projecting luffer-board, leaving an opening also from the closet itself.

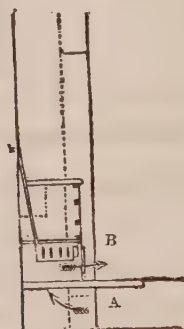
*Elevation Plan and Section of a Grate, showing the manner in which it is proposed to admit Air to the Room and Fire by means of Slots furnished with Sliding Regulators.*



A. Opening into air-flue.  
B. Sliding regulators.



A. Air-flue.



A. Opening into air-flue.  
B. Sliding regulators.

*The Arrows indicate the direction of the Current.*



TABLE in illustration of the Statement in respect to the Increase of Births being consequent upon an excessive rate of Mortality, extracted from Tables in the Occupation Abstract of the Population Returns for England and Wales, p. 10.

England and Wales.	Annual Proportion per Cent. of Deaths of Children under One Year of Age to total Births.	Proportion of Annual Deaths to each 10,000 of the Population.	Proportion of Annual Births to each 10,000 of the Population.	Assumed Natural Increase of the Population from Births per Cent. from 1831 to 1841.	Proportion of Annual Marriages to each 10,000 of the Population.	Proportion of Young Children alive under 5 Years of Age to each 10,000 of the Population.	Proportion of Persons alive above 50 Years of Age to each 10,000 of the Population.
Eleven Counties where the proportion of Deaths of Children in proportion to total deaths is the least .	10·7	192·9	291·5	9·8	67·4	1294	1575
Eleven Counties where the proportion of Deaths of Infants under one year of age is intermediate .	12·9	204·1	302·8	9·8	68·8	1315	1485
Eleven Counties where the proportions of Infant Deaths to total deaths are intermediate . . .	14·8	219·1	327·3	10·8	76·6	1334	1378
Eleven Counties where the proportions of Infant Deaths to total deaths are the highest . . . .	16·4	229·3	339·3	11·0	84·0	1263	1335

## CITIES AND TOWNS.

COMPARATIVE POPULATION in 1831 and 1841, showing the Rate of Increase or Decrease per Cent. (placed in the order of their Rate of Increase or Decrease).

CITIES AND TOWNS.	Population within the same limits in		Increase per Cent.
	1831	1841	
West Bromwich. . . . .	15,327	26,121	70·4
Bishop Wearmouth. . . . .	14,462	24,206	67·4
Dukinfield . . . . .	14,681	22,394	52·5
Preston . . . . .	33,112	50,131	51·4
Merthyr Tydvil . . . . .	22,083	34,977	50·8
Bradford . . . . .	23,223	34,560	48·8
Wolverhampton . . . . .	24,732	36,382	47·1
Woolwich . . . . .	17,661	25,785	46·0
Southampton . . . . .	19,324	27,744	43·6
Ecclesall Bierlow . . . . .	14,279	19,984	40·0
Liverpool. . . . .	189,242	264,298	39·6
Durham . . . . .	10,135	14,151	39·6
Bilston . . . . .	14,492	20,181	39·3
Derby . . . . .	23,627	32,741	38·6
Northampton . . . . .	15,351	21,242	38·4

Comparative Population in 1831 and 1841, showing the Rate of Increase or Decrease per Cent.—*continued.*

CITIES AND TOWNS.	Population within the same limits in		Increase per Cent.
	1831	1841	
Walsall . . . . .	15,066	20,852	38·4
Ashton-under-Lyne . . . . .	33,597	46,304	37·8
Wednesbury . . . . .	8,437	11,625	37·8
Bury . . . . .	15,086	20,710	37·3
Cheltenham . . . . .	22,942	31,411	36·9
Dudley . . . . .	23,043	31,232	35·5
Blackburn . . . . .	27,091	36,629	25·2
Huddersfield . . . . .	19,035	25,068	31·7
Oldham . . . . .	32,381	42,595	31·5
Heaton Norris . . . . .	11,238	14,629	30·2
Manchester . . . . .	227,808	296,183	30·0
Halifax . . . . .	15,382	19,881	29·9
Birmingham . . . . .	146,986	190,542	29·6
Lane-end and Longton . . . . .	9,608	12,345	29·5
Gateshead . . . . .	15,177	19,505	28·5
Swansea . . . . .	13,256	16,787	26·6
Burslem . . . . .	12,714	16,091	26·5
Hull . . . . .	32,958	41,629	26·3
Chatham and Rochester . . . . .	26,376	33,174	25·7
Hanley and Shelton . . . . .	16,388	20,564	25·5
Little Bolton . . . . .	12,896	16,153	25·3
Leicester . . . . .	40,512	50,733	25·2
Stoke-upon-Trent . . . . .	37,220	46,342	24·5
Leeds . . . . .	123,393	151,874	23·1
Ipswich . . . . .	20,528	25,264	23·1
Wigan . . . . .	20,774	25,517	22·8
Lincoln . . . . .	13,203	16,172	22·5
Stourbridge . . . . .	6,148	7,481	21·7
Reading . . . . .	15,595	18,937	21·4
Wakefield . . . . .	12,232	14,754	20·6
King's Lynn . . . . .	13,370	16,039	20·0
Great Bolton . . . . .	28,299	33,610	18·8
Gloucester . . . . .	11,933	14,152	18·6
Warrington . . . . .	16,018	18,981	18·4
Bristol . . . . .	103,886	122,296	18·3
Maidstone . . . . .	15,387	18,086	17·5
Deptford . . . . .	19,795	23,165	17·0
Cambridge . . . . .	20,917	24,453	16·9
Newcastle-on-Tyne . . . . .	42,760	49,860	16·6
Rochdale . . . . .	58,441	67,889	16·2
Sheffield . . . . .	59,011	68,186	15·5
Oxford . . . . .	20,649	23,834	15·4
Carlisle . . . . .	20,006	23,012	15·0
The Metropolis . . . . .	1,471,941	1,690,084	14·8
Brighton . . . . .	40,634	46,661	14·8



Comparative Population in 1831 and 1841, showing the Rate of Increase or Decrease per Cent.—*continued.*

CITIES AND TOWNS.	Population. within the same limits in		Increase per Cent.
	1831	1841	
Yarmouth . . . . .	21,115	24,086	14.1
Coventry . . . . .	27,070	30,743	13.6
Canterbury . . . . .	13,679	15,435	12.8
Wrexham . . . . .	11,408	12,797	12.1
Stockport . . . . .	25,469	28,431	11.6
Shields, North . . . . .	6,744	7,509	11.3
Exeter . . . . .	28,242	31,312	10.9
Colchester . . . . .	16,167	17,790	10.0
Worcester . . . . .	17,811	19,473	9.3
Chester . . . . .	21,344	23,115	8.3
Plymouth, Devonport, and Stone- house . . . . .	75,534	80,059	6.0
York . . . . .	26,260	27,818	5.9
Saddleworth . . . . .	15,986	16,829	5.3
Portsmouth . . . . .	50,389	53,032	5.2
Nottingham . . . . .	50,680	53,091	4.8
Macclesfield . . . . .	23,129	24,137	4.4
Norwich . . . . .	61,116	62,344	2.0
Bath . . . . .	38,063	38,314	0.7
Shields, South . . . . .	9,074	9,082	0.0
			Decrease per Cent.
Sunderland . . . . .	17,060	17,022	0.2
Shrewsbury . . . . .	21,297	20,921	1.8
Frome . . . . .	12,240	11,849	3.2
Kidderminster . . . . .	14,981	14,399	4.0

## COUNTIES.

COMPARATIVE POPULATION in 1831 and 1841, showing the Rate of Increase per Cent. (placed in the order of their Rate of Increase.)

COUNTIES.	Population.		Increase per Cent.
	1831	1841	
Monmouth . . . . .	98,130	134,355	36.9
Glamorgan . . . . .	126,612	171,188	35.2
Durham . . . . .	253,910	324,284	27.7
Lancaster . . . . .	1,336,854	1,667,054	24.7
Stafford . . . . .	410,512	510,504	24.3
Carnarvon . . . . .	66,448	81,093	22.0
Surrey . . . . .	486,334	582,678	19.8
Warwick . . . . .	336,610	410,715	19.3
Chester . . . . .	334,391	395,660	18.3
York, West Riding . . . . .	976,350	1,154,101	18.2
Brecon . . . . .	47,763	55,603	16.4

Comparative Population in 1831 and 1841, showing the Rate of Increase per Cent.—*continued.*

COUNTIES.	Population.		Increase per cent.
	1831	1841	
Middlesex . . . . .	1,358,330	1,576,636	16·0
York, East Riding . . . . .	168,891	194,936	15·4
Derby . . . . .	237,170	272,217	14·7
Kent . . . . .	479,155	548,337	14·4
Cambridge . . . . .	143,955	164,459	14·2
Lincoln . . . . .	317,465	362,602	14·2
Cornwall . . . . .	300,938	341,279	13·4
Bedford . . . . .	95,483	107,936	13·0
Southampton (Hants). . . . .	314,280	355,004	12·9
Northumberland . . . . .	222,912	250,278	12·2
Flint . . . . .	60,012	66,919	11·5
Gloucester . . . . .	387,019	431,383	11·4
Merioneth . . . . .	35,315	39,332	11·3
Northampton . . . . .	179,336	199,228	11·0
Nottingham . . . . .	225,327	249,910	10·9
Berks . . . . .	145,389	161,147	10·8
Worcester . . . . .	211,365	233,336	10·4
Huntingdon . . . . .	53,192	58,549	10·0
Sussex . . . . .	272,340	299,753	10·0
Dorset . . . . .	159,252	175,043	9·9
Rutland . . . . .	19,385	21,302	9·9
Hertford . . . . .	143,341	157,207	9·6
Leicester . . . . .	197,003	215,867	9·5
Essex . . . . .	317,507	344,979	8·6
York City and Ainsty . . . . .	35,362	38,321	8·3
Pembroke . . . . .	81,425	88,044	8·1
Devon . . . . .	494,478	533,460	7·8
Somerset . . . . .	404,200	435,982	7·8
Wilts . . . . .	240,156	358,733	7·7
Salop . . . . .	222,938	239,048	7·0
York, North Riding . . . . .	190,156	204,122	7·0
Buckingham . . . . .	146,529	155,983	6·4
Suffolk . . . . .	296,317	315,073	6·3
Oxford . . . . .	152,156	161,643	6·2
Denbigh . . . . .	83,629	88,866	6·2
Cardigan . . . . .	64,780	68,766	6·1
Norfolk . . . . .	390,054	412,664	5·7
Carmarthen . . . . .	100,740	106,326	5·5
Anglesey . . . . .	48,325	50,891	5·3
Cumberland . . . . .	169,681	178,038	4·9
Montgomery . . . . .	66,482	69,219	4·1
Radnor . . . . .	24,651	25,356	2·8
Westmoreland . . . . .	55,041	56,454	2·5
Hereford . . . . .	111,211	113,878	2·4
Total of England . . . . .	13,091,005	14,995,138	14·5
Total of Wales . . . . .	806,182	911,603	13·0



A LIST of BOROUGHs having BYE-LAWS for the Prevention of Nuisances, under the Provisions of 5 and 6 Will. IV., c. 76, s. 90.

Barbastle.	Devonport.	Marlborough.	Shaftesbury.
Beccles.	Droitwich.	Monmouth	Sheffield.
Berwick-on-Tweed.	Evesham.	Morpeth.	Shrewsbury.
Beverley.	Falmouth.	Newark.	Southampton.
Bewdley.	Flint.	Newcastle-upon-	South Molton.
Bideford.	Folkestone.	Tyne.	Southwold.
Birmingham.	Gateshead.	Newport (Isle of	Stockport.
Blandford-Forum.	Glastonbury.	Wight).	Stockton.
Bodmin.	Gloucester.	Northampton.	Stratford-upon-
Bolton.	Grantham.	Norwich.	Avon.
Bridgnorth.	Gravesend.	Nottingham.	Sunderland.
Bridgewater.	Great Grimsby.	Oswestry.	Tamworth.
Buckingham.	Kendal.	Oxford.	Tenterden.
Bury St. Edmunds.	Kidderminster.	Pembroke.	Tewkesbury.
Calne.	King's Lynn.	Penrhyn.	Thetford.
Canterbury.	Kingston-upon-	Penzance.	Tiverton.
Carlisle.	Hall.	Poole.	Torrington, Great.
Carnarvon.	Kingston-upon-	Pwllheli.	Walsall.
Chard.	Thames.	Retford, East.	Welsh Pool.
Chesterfield.	Leicester.	Richmond.	Wells.
Chipping Norton.	Lichfield.	Ripon.	Wigan.
Clitheroe.	Liskeard.	Ruthin.	Winchester.
Congleton.	Liverpool.	Rye.	Worcester.
Coventry.	Llandoverly.	Saint Ives.	Yarmouth, Great.
Denbigh.	Llanidloes.	Scarborough.	
Derby.	Lyme Regis.	Sarum, New.	

SEWERS.—Abstract of Returns, Rack Rental of Assessable Property, Number of Houses, Amount of Population, and Annual Average Rate in the £ for 10 Years.

COMMISSIONS.	Rack Rental of Assessable Property.	Estimated Number of Houses.	Estimated Amount of Population.	Average Annual Rate for 10 Years.
	£.			d.
City of London . . . . .	1,002,960	17,647	125,008	4
Westminster:—				
Eastern division . . . . .	800,499	14,939	370,916	$\left\{ \begin{array}{l} 1\frac{3}{4}^* \\ 1\frac{1}{4}^* \\ 3\frac{1}{2}^* \\ 4^* \end{array} \right\}$
Western division . . . . .	1,328,759	18,701		
Ranelagh division . . . . .	585,476	15,423		
Counters Creek division . . . . .	134,349	3,925		
Tower Hamlets:—				
Spitalfields level . . . . .	628,522	55,104	347,382	$\left\{ \begin{array}{l} 2 \\ 4\frac{1}{2}^\dagger \\ 1\frac{1}{2} \\ 3 \\ \frac{1}{2} \\ \frac{1}{2} \\ 1 \end{array} \right\}$
Hackney Brook level . . . . .	123,377			
Wapping level . . . . .	44,023			
Limehouse level . . . . .	15,210			
Tower-hill level . . . . .	23,944			
Hermitage-street level . . . . .	18,964			
Upper Limehouse level . . . . .	13,607			
Holborn and Finsbury:—				
Holborn division . . . . .	886,500	17,780	124,460	2
Finsbury division . . . . .	856,550	35,093	245,651	2
Surrey and Kent Commissioners	902,361	55,230	413,518	between 5d. & 6d. = 5½d.
	7,365,101	233,842	1,626,935	2¾†

\* Land is rated one-third the rate on houses.

† The litigation carried on by the inhabitants prevented any rate being made on this level from 1829 to 1840. In 1840, a rate 1s. 6d.; in 1841, 1s.; and in 1843, 1s.

‡ Average (nearly).

## SEWERS, WESTMINSTER, &amp;c.

EXTRACTS from Orders of Court, relating to the arrangement made for settling the Boundaries between the Westminster and the Holborn and Finsbury Commissioners.

16th June, 1815.

ORDERED, That the surveyor do prepare, within a week from this time, a copy of the plan showing the line of demarcation between the Commission of Sewers for the Holborn and Finsbury Division and this Commission, as settled at a meeting of the Deputations from the two Commissions on the 28th April last, with the small deviation therefrom, since agreed upon by the surveyors of the respective Commissions; the plan in other respects to remain the same as laid down at the said meeting.

ORDERED, That the clerk do transmit the copy of the plan above mentioned to the office of the Commissioners of Sewers for the Holborn and Finsbury Division, accompanied by a letter, requesting that it may be examined by the surveyor of that Commission, and if found to be correct that it may be laid before their Court at its next meeting, in order that it may receive the signature of the Chairman of that Commission; and further, that the clerk do request that in the mean time the surveyor to the Holborn and Finsbury Division may send to this office on his part a copy of the said plan, with the small deviation above mentioned, in time for its being examined by the surveyor to this Commission, and laid before the Court on the 21st July next, in order to its being signed by the Chairman of this Commission; the two plans to be afterwards interchanged, as proposed at the meeting of the deputations from the two Commissions before mentioned.

21st July, 1815.

The surveyor presented, in pursuance of the Order of Court on the 16th ultimo, a plan showing the line of demarcation between the Commission of the Holborn and Finsbury Division and this Commission, which he had received from the surveyor to that Commission, and stated, that having examined the same, he had found it to be correct. And the said plan having been approved by the Court, it was Ordered, that it should be signed by the Chairman as follows, viz.:—

“ Approved, and signed by order of the Court of Sewers for the City and Liberty of Westminster, and part of the County of Middlesex, this 21st day of July, 1815.

“ GEORGE SAUNDERS, Chairman.”

And the said plan so signed was then sent to the office of the Holborn and Finsbury Commission.

And a counter plan having been received during the sitting of the Court from the Holborn and Finsbury Commission, signed by the Chairman of their Court, it was verified by the signature of the Chairman of this Court, and deposited with the records of this Commission.

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The two following Clauses are extracted from an Act, 56 George III cap. 87, for granting certain powers to the Gas Light and Coke Company.



They are repeated almost verbatim in the Acts relating to the following Gas Companies:—City of London, 57 Geo. III., c. 23; South London, 1 & 2 Geo. IV. c. 51; Aldgate, &c., 4 Geo. IV., c. 98; Southwark, 5 Geo. IV., c. 78; Independent, 10 Geo. IV., c. 118; British, 10 Geo. IV., c. 127.

CLAUSE XI.—“ And be it further enacted, That the Court of Directors of the said Company shall, and they are hereby required, within one calendar month after every half-yearly general meeting of the said Company, or oftener, if required by the Right Honourable the Secretary of State for the Home Department for the time being, to transmit to the said Secretary of State a report in writing, signed by the governor, deputy governor, or one of the directors of the said Company, of the state of the said Company and of their works, and the means possessed by the said Company for securing the continuance of their operations, and such other matters relating to the works and proceedings of the said Company as the said Secretary of State shall from time to time require.”

CLAUSE XII.—“ And be it further enacted, That all stations and works of the said Company shall be open at all convenient times for the inspection and examination of such person or persons as the said Secretary of State for the Home Department for the time being shall appoint from time to time for that purpose; and the said Company shall, and they are hereby required to conform to such regulations and proceedings in the several parts of their works and operations, as well in respect of those already erected or executed as of such as shall hereafter be erected and executed, as the said Secretary of State shall consider necessary and proper, and shall direct to be adopted, for the better and more effectually lighting the several parts of the metropolis, and the suburbs, liberties, and precincts thereof, where the mains and pipes of the said Company shall lie, and for more effectually securing a proper and permanent supply of gas for lighting the public lamps therein, and for assisting and advancing the benefits to be derived from an active and efficient police, and for such other purposes as to the said Secretary of State shall seem meet and proper for the advantage of the public.”

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EXTRACT from an Act, 4 George IV., cap. 119, enlarging and amending several Acts relating to the Gas Light and Coke Company.

Part of CLAUSE IV.—“ And provided also, That all the other main and service pipes and apparatus now belonging to the Gas Light and Coke Company, without the line first herein before described, shall be given up to the said Imperial Gas Light and Coke Company, upon a like valuation and payment as aforesaid, whenever the Secretary of State for the Home Department for the time being, or such appointee as aforesaid, shall certify that the inhabitants of the district without the line first herein before described may, in his judgment, depend upon an equal supply of gas light from the said Imperial Gas Light and Coke Company to the supply which they have heretofore received from the said Gas Light and Coke Company; and until such certificate be granted, it shall be lawful for the said Gas Light and Coke Company to continue such supply of gas without the line aforesaid as if this Act had not been passed; and, upon such certificate as aforesaid being granted, the said Imperial Gas Light and Coke Company shall pay to the said Gas Light and Coke

Company the value of such main and service pipes and apparatus as the said Gas Light and Coke Company shall be possessed of without the line herein before described, and which they are not at liberty to retain for four years from the passing of this Act as aforesaid.”

*Form and Regulations adopted under an Act for regulating the Police of the Burgh of Calton (part of Glasgow), 3 Vic., cap. 28.*

“BURGH OF CALTON AND MILE-END.

“*Lodging-house, No.      of Register,*

“Is situated in No.      , and consists of

and is kept by

“The number of the keeper’s family, including      self, is

“The keeper of this house is allowed to receive lodgers therein at a time, in addition to      own family; and, if a larger number is admitted, or any of the provisions of the Police Acts, or rules or instructions of the Commissioners of Police, are violated, the keeper incurs a penalty not exceeding 2*l.* for each offence.

“*Court House, Calton,*      , 184 .

*Superintendent of Police.*

“In addition to the provisions contained in the Police Acts, the Commissioners of Police have, in terms of the powers thereby conferred on them, enacted, and appointed all keepers of lodging-houses to observe the following Rules and Instructions:—

“1. The floors are to be washed at least twice in each week, viz., on Wednesday and Saturday.

“2. The walls are to be whitewashed, and the houses thoroughly cleaned, on the first day of each of the months of June, August, November, and March, or on the following day, if any of these days fall on Sunday.

“3. The blankets used in all lodging-houses are to be thoroughly cleaned and scoured on the eighth day of each of the months of June, August, November, and March, or on the following day, if any of these days fall on Sunday; and, if any person or persons in such house shall be affected with fever or other infectious disease, the blankets and bed-clothes used by such person or persons shall be thoroughly cleaned and scoured immediately after the removal of such person or persons; and the bedding used by such person or persons affected with contagious disease, shall be fumigated immediately after the removal of such person or persons; and, where the bedding used is shavings or straw, the same shall be burned immediately after such removal.

“By order of the Board of Police of Calton.”

MEMORIAL from the SOUTHWARK and VAUXHALL WATER COMPANIES.

*To the Commissioners for Inquiring into the State of large Towns and Populous Districts.*

1. The Directors of the Southwark and Vauxhall Water Companies beg leave respectfully to call the attention of the “Commissioners for inquiring into the State of large Towns and populous Districts,” to



the following statement of facts, relating to the supply of water to the Metropolis south of the Thames.

2. The Companies by which that portion of the Metropolis is supplied (the Southwark, the Vauxhall, and the Lambeth Water Companies) were, from the periods of their being respectively established, and prior to 1834, in possession of charters which more or less permitted or encouraged competition; but in that year having all had occasion to apply to the Legislature for further powers to raise capital, certain restrictions, which tended in some cases to preserve the several Companies' districts free from the operations of the others, were removed, and from that period a competition, in which sometimes two, sometimes all three Companies, were engaged, has ensued, which was in full activity during the years 1839, 1840, and 1841, and which has only completely ceased since 1842.

3. The results of that competition were as inconvenient to the public as they were disastrous to the Companies, and afforded the very strongest illustration of the truth of the doctrine laid down by the Committee of the House of Commons in 1819, that the principle of competition cannot with advantage be applied to the operations of Water Companies.

4. As regards the Companies, the result of the struggle was an immense expenditure of capital in utter waste—double or treble sets of mains and pipes being laid down in districts, where one set would better have served the inhabitants. An enormous annual outlay, equally in utter waste—in the salaries of canvassers and commission to agents, who procured tenants—in the bills of plumbers who changed the service-pipes of the tenants from one set of mains to another—in the charges of taking up and relaying roads and pavements on the like occasions\*—in double and treble sets of turncocks and pipe-layers—and, as the climax of absurdity, a payment of all parochial and district rates in every parish on all the pipes of all the Companies in proportion to the capital expended on assumed profits or interest, which it is needless to say had no existence. These expenses being accompanied by a great reduction of rates, the result was such as might have been anticipated; one of the Companies, overwhelmed with difficulties and debt, ceased to pay dividends to its shareholders; the other two must shortly have arrived at the same condition; and the total return on more than half a million of capital expended has not since been, and is not now, more than £2 $\frac{3}{4}$  per cent. per annum.

5. The inconvenience as regards the public was scarcely less striking. The funds which should have been devoted to improving the supply of water were wasted—the districts which, being densely peopled, were supposed likely to yield a return, were encumbered with double and treble sets of pipes, and disturbed by the daily breaking up of the streets and roads, consequent on the incessant change of tenants from one Company's mains to those of another—while other districts less thickly inhabited were left without the supply necessary for domestic convenience, or protection from fire. The impoverishment of the Companies, arising from the double source of unnecessary expenditure and

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\* The expenditure of the three Companies for these three items alone, namely, canvassing and commission, plumbers' bills and taking up and re-laying pavements, &c., amounted in the year 1841 to not less than £4,300.

uncalled for reduction of rates, tended to incapacitate them from adequately discharging their duties to the public, and left them neither means, leisure, nor inclination, for improving to the utmost the supply of water given to their tenants. Independently of the wasted capital in superfluous mains and pipes, the sum, as above stated, annually thrown away in plumbing, paving, and canvassing, was more than adequate to the depuration by deposit and filtration of the supply to all the tenants of the three Companies. Neither was the sole end, which it might perhaps be supposed competition would answer, permanently attained. The prospect of impending ruin compelled a suspension of hostilities, and the rates of the whole district were raised to a level, which though still very low as compared with the rest of London, are yet at least as high as would have obtained had there been no competition.

6. The cessation of the competition and of the consequent absorption of the means and attention of the Companies has already begun to produce its natural and salutary effect. The Southwark Company have already in full operation at Battersea reservoirs of deposit and filtration, which enable them to supply to all their tenants, 18,000 in number, perfectly pure and bright water, while in every part of their district the mains are charged at a high pressure for the extinction of fire. Arrangements are already made requiring only the authority of Parliament, for carrying the agreement between the Companies into effect for amalgamating the Southwark and Vauxhall Companies, and that portion of the Metropolis south of the Thames served by the united Companies, and comprising 34,000 to 35,000 tenants, will then have a supply, not to be surpassed in quality or abundance.

7. Of the facts above stated, it is believed that the Commissioners are already to a considerable extent in possession; but the Directors are prepared to afford, in the fullest detail, whatever information respecting the affairs of the Companies the Commissioners may require.

8. The Directors beg leave further to state that they shall be ready most willingly to concur in any plans which the Legislature or executive Government may prescribe or suggest for the better securing the public health, safety, or convenience,—feeling convinced that the interests of their shareholders will be best consulted by their furnishing to all classes, under all circumstances, supplies of water, to which no reasonable objection as regards either quality or price can be taken.

9. With the above statement of facts relating to the supply of water south of the Thames, and the expression of their readiness to concur in any plans of improvement, the Directors would have rested satisfied, in the full conviction that the diffusion of the information obtained by the Commissioners must ultimately ensure the prevalence of sound opinions on the important question of the supply of water to large towns, had they not observed that notice has been given of an application to Parliament, for a bill for the establishment of a Company, to supply the Metropolis south of the Thames, as well as some portions of the town on the north of the Thames, with water from the Wandle.

10. They cannot anticipate that a scheme so extravagant as that which has been announced will receive the sanction of Parliament; but as the striking evidence collected by the Commissioners can scarcely yet be supposed to be fully and generally known either to the members



of the Legislature or to the public, and the results of carrying the scheme into effect would be disastrous in no common degree both to the existing Companies and the inhabitants of the districts they supply, the Directors feel that they should be wanting in their duty alike to the public, and those, whose interests they are bound to protect, did they not respectfully urge upon the Commissioners the importance of some expression of opinion, as the result of the information of which they are already in possession, which might excite the attention and awaken the caution both of the Legislature and the public.

11. The outlay on the scheme proposed (the using the waters of the Wandle at their junction with the Thames, culverts being brought down from the source of the river on either side to prevent the influx of any and all drainage) would be, even supposing the plan otherwise practicable or expedient, preposterously great. The whole expense of depositing, filtering, and bringing the water from Wandsworth and distributing it through the wide districts to be served, being to be incurred in addition to the great expenditure necessary for the formation of the culverts to intercept the drainage, and the compensation to millers for the diversion of the feeders, on which they must at least partially rely, and to other parties, whose grounds the culverts must traverse.

12. This outlay, as regards the districts south of the Thames alone, would certainly not fall short of, it would probably exceed, the £500,000 or £600,000 already expended by the three South Metropolitan Water Companies; and the result would be, only, to bring to these districts an inferior supply of water; the Thames water, when filtered, being, as well by reports of the most eminent chemists, as by common experience, ascertained to be softer and fitter for domestic use than the water of the Wandle.

13. But the entire waste of the capital expended would be but the commencement of the evil created by the execution of the proposed scheme. The competition recently terminated would be renewed with augmented fierceness, as added capital would have to find remuneration from the same amount of tenants. The existing Companies would, it might be thought, derive some advantage in the struggle from the superior fitness for domestic purposes of Thames water over the Wandle water; but experience has shown, and especially in poor districts, such as the greater portion of the metropolis south of the Thames, that cheapness is the great element of successful warfare; and the old Companies, equally with the new Company, would be driven to compete with each other down to the point of general ruin. This struggle would last probably for some years,—attended of course by all its usual concomitants, treble and quadruple sets of mains and pipes in every street, treble and quadruple officers and servants, treble and quadruple parish rates, and thousands annually spent in plumbers' bills and paving.

14. The conflict would of course also have its usual termination. The Companies would either agree to divide the whole district among them, or they would agree to a scale of rates. But there would then be an additional half million on which interest must be paid, and an additional establishment to be supported,—burthens which an augmentation of from 50 to 100 per cent. of the present rates would scarcely suffice to support. That such would be the inevitable result of the

establishment of the proposed Company, the Directors are quite sure that the Commissioners are prepared, from the information already in their possession, confidently to anticipate.

15. The Directors will conclude the observations with which they have ventured to trouble the Commissioners, by calling their attention to one consideration, which seems to them of no trifling importance with reference to the question to which the foregoing statement relates. It is highly probable, certain perhaps, that the result of the inquiries of the Commissioners will be a general conviction that more extended supplies of water than are at present distributed in great towns, are imperatively required for many purposes of public health, safety, and convenience. It is further probable, the Directors presume, that whatever might be the theoretical advantages of such a plan, neither the Legislature nor the public would be at once prepared to commit to the charge of the Executive Government the whole machinery of supply. It remains only that the existing establishments should continue to be the agents for the distribution of water, subject to such control as the Legislature may think fit to impose, intrusted with the various duties naturally connected with the supply of water, and remunerated to such extent and by such process as to Parliament may seem reasonable. The Directors are quite satisfied that in all the measures for an extended supply of water which might be thought desirable for the public welfare, the existing Companies would be found willing coadjutors, but they cannot perceive how the Water Companies are to be made efficient instruments in any such system unless the services of each Company be restricted to a given district. They do not see how an effectual responsibility for the discharge of the contemplated duties can be created, when two, three, or more Companies are simultaneously serving in the same districts, nor how the remuneration for what may probably be in many cases a large preliminary outlay, can be secured to the Company by which it will have been incurred.

Signed by order of the Board of }  
Southwark Water Company }

JAMES ROSSITER, *Secretary.*

Signed by order of the Board of }  
Vauxhall Water Company. }

WM. BUTTERWORTH, *Secretary.*

10th Jan. 1845.



## LOCAL REPORTS.





# REPORT

ON

## THE STATE OF BIRMINGHAM AND OTHER LARGE TOWNS.

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BY ROBERT A. SLANEY, Esq.,

ONE OF THE COMMISSIONERS APPOINTED BY HER MAJESTY FOR INQUIRING INTO THE  
STATE OF LARGE TOWNS AND POPULOUS DISTRICTS IN ENGLAND AND WALES.

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## REPORT ON THE STATE OF BIRMINGHAM AND OTHER TOWNS.

By ROBERT A. SLANEY, Esq.,

*One of the Commissioners for inquiring into the Causes of Disease, and the best means of promoting the Public Health, among the Inhabitants of Large Towns and Populous Districts.*

In drawing up a Report on the state of Birmingham and other towns inspected, it may be useful to state—

1. The course of proceeding.
2. The general result.
3. Any general observations connected with the subject.

The usual course of proceeding adopted was, for the Commissioner, some time before his visit to these towns, to communicate in writing with the Mayor, or other principal authority, giving notice of his intention, explaining the objects of the Commission, (a copy of which, with the printed questions, was enclosed,) and requesting that a committee of the most respectable and intelligent inhabitants might be formed, for the purpose of giving information and assistance.

Care was taken to state, that as the objects of the Commission were for the general good, all party feeling, whether of a public or local nature, should, as far as possible, be laid aside in the selection of the committee and the prosecution of the inquiry.

Sometimes a communication of a like nature as to the objects of the inquiry was made through private individuals of intelligence and influence, who happened to reside in the town and district, and whose aid was requested in forming such a committee.

In all cases these requests were met in a kind and obliging manner, and the most ready assistance was afforded by all parties.

It is a pleasure to be able to state, that the most distinguished men belonging to the medical profession were always among the first to volunteer their gratuitous and valuable attendance.

A day being fixed for the committee to assemble, either in a public or private meeting, as had before been determined, the Commissioner, who had before visited all the worst parts of the town or district, and made many inquiries, attended the meeting.

The Commission was then read, its principal objects explained, and any information in his power afforded by the Commissioner, who endeavoured to point out the importance of the subject to all classes, and to show how much the public health, moral habits, and happiness of the poorer classes would be improved by attention to sanatory regulations and cleanliness in and about their dwellings; and how true an economy it would be eventually, to promote all such public improvements as may conduce to this end.

The state of the town or district was then entered upon, and any information or suggestion worth attention was noted down.

The printed questions agreed to by the Commission were then read and explained, and left with the local committee, to be replied to after due inquiry. The answers sent in sometimes led to additional investigation, and were often compared with the notes which had been made upon the spot.

Although the principal inhabitants and local authorities gave every facility and aid to the investigation of the Commissioner, yet it must be observed, that the replies to the questions were frequently of too favourable a nature, arising sometimes perhaps from a natural desire in the parties answering to represent things in the best light, and to avoid any imputation of neglect, and sometimes from not having had their attention called to the existence of evils close to them, which did not immediately affect themselves.

The towns of which it is proposed to give a short report may be divided into three classes:—

- 1st. Birmingham, and the other towns in its vicinity, in which the people are chiefly engaged in the manufacture of metals, or in mining.
- 2nd. The towns in Staffordshire, called the Potteries, with Newcastle-under-Lyme, near them.
- 3rd. Several isolated county towns, having no common character, as Chester, Shrewsbury, Wrexham, and Gloucester.

Birmingham, containing 189,000 inhabitants, is perhaps one of the most healthy of our large towns. It possesses many natural advantages—as a good site, with adequate fall for drainage; a dry and porous subsoil, and water generally of good quality. A good and cheap supply of coal is found in the vicinity.

It would be useless to give any long detail of the state of the town, as it has been so recently and, in general, so accurately described in “The Report on the State of the Public Health in the Borough of Birmingham, by a Committee of Physicians and Surgeons.” I am able to bear my willing testimony to the ability and industry manifested in that Report: I have been able to verify most of its statements respecting the neglected condition of the houses of the poorer classes; and if I sometimes differ from its opinions or conclusions, it is with deference and respect.

The principal streets of Birmingham are generally wide, well made, and with sufficient fall; in the parish of Birmingham, the drains in the main streets are well laid, and tolerably attended to. The houses of the richer and middle classes appear generally dry and airy, and with convenient buildings appendent to them. The supply of water for these classes is good, and the drainage and cleansing is little complained of, though susceptible of considerable improvement.

The state of the habitations of the working and poorer classes is often widely different. Their houses vary indeed greatly in comfort and convenience, as in size and situation, and the excellent custom of each family having a house to themselves appears generally to prevail. I am obliged, however, reluctantly to say, that many, if not most of, the narrow streets, alleys, and courts, in which their habitations are situated, are much neglected as regards drainage, paving, and cleans-



ing, and though wells are found in most of them, they are frequently out of order, or the water indifferent.

The courts in the parish of Birmingham alone are above 2,000 in number, and their inhabitants exceed 50,000; besides many in the adjacent parish of Aston. "The ingress to most of the courts is by a narrow entry, from three to four feet in width. This is generally arched and built over, so as to form part of the houses fronting the street. The ventilation of the court is by this narrow and covered state of the entry very much impeded." The number of houses in each court varies from four or five to 20 or 30. At the end, or on one side, there is often a washhouse, sometimes an ash-pit, and always one or two privies, or sets of privies, close to which there is often one or more pigsties,\* tubs full of hog-wash, and heaps of offensive manure. In the midst of the court stands the pump of supply for the inhabitants. These courts are frequently unpaved, and the open channel for dirty water ill-defined, so that stagnant puddles in wet weather are the consequence.†

In many, the overflowings from the privy-vaults, pigsties, and dirt-heaps, trickling down the court, pass close to the well, and no doubt often enter it. Many of these courts are unpaved. There appears to be no system of sweeping or cleansing of any kind, except what is from time to time done by the inhabitants themselves. The smaller streets are also much neglected in this respect; and this remark applies to every town visited.

In Birmingham, and many of the towns round it, the privies belonging to houses of the working classes, and many others, are constructed in almost all cases with open vaults for the night-soil at the back or side of the building. These are not covered over with either stone, wood, or earth, but exhale continually a most offensive stench. They are sometimes fenced round with a low wall, but often left quite open. In either case, ashes, stalks of vegetables, and other refuse, are thrown in, and the mass is left to taint the air from month to month. In rainy weather this receptacle of filth often overflows, and traces its fetid course through the open channel of the court or alley, and along the pathway entrance, till it reaches the street.

The report of the former Committee on the State of Birmingham said with great truth, "There appears in general to be no drainage for the

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\* A return of the number of pigsties and pigs kept in the borough, and accessible to the police, September 6, 1843, was as follows:—

	Sties.	Pigs.
In Birmingham parish . . .	1,681	2,366
In Edgbaston parish . . .	54	165
In Aston within the Borough .	624	844
Total . . .	2,359	3,375

*From the Registrar, Mr. Knight.*

The number of Irish in Birmingham, by the census of 1841, was 4,683.—*Population Return.*

† "Courts and alleys are not regularly cleansed by appointed scavengers, &c.; such courts and alleys are frequently found in a very filthy state."—*Reply of Local Committee.*

privies by which their more fluid contents might pass away ;” and adds, “the privies and ash-pits in the courts in our opinion require regular inspection and cleansing.”\*

The neglect of all public regulations for draining, cleansing, or paving the courts and alleys in which the poorer classes reside, prevails in all the towns and districts visited. In a few towns, as Shrewsbury and Newcastle-under-Lyme, there are bye-laws or regulations to prevent nuisances and *ensure* cleanliness, but in none of them are these regulations enforced.

I have never found any powers given, or any rules laid down, for a periodical inspection or report on the state of these crowded districts by the authorities of the place within which they are situated. Even if at the instance of any benevolent persons such report were made, it does not appear that the municipal bodies, the constituted authorities, or parochial Boards or Unions, have such powers as would enable them to carry out the improvements that are necessary for the health and comfort of the poorer classes: and in none of the towns visited is there any system of contracts with scavengers or nightmen to clear away at proper stated periods all refuse, filth, and night-soil from the courts and small streets† inhabited by the poorer classes, though some such provision is urgently required for the health of all the community, and for preserving decent self-respect among the mass of the people.

“It is a common custom throughout the town” (says the report before quoted) “to empty the contents of the ash-pits and privies in the night into the streets, from which they are carted away early the following morning; but some filth always remains after this proceeding.”‡ This is the mode in which this disagreeable duty is performed where the police regulations are best observed; but in many of the other towns complaints are made of the removal of these matters during the day, and in a manner to create great annoyance to the inhabitants, and great disgust to passengers.§

It has been stated that in no one of the towns visited is the filth and ashes from these populous courts, alleys, and streets cleared away by contract (as in London), or under any general authority to enforce its due performance, which would be the cheapest as well as the most effectual way. The present method is for each inhabitant to make his separate bargain with some farmer, or person who sells to the farmer, to clear and carry away the filth and refuse belonging to him. In some cases (chiefly the larger towns) a trifle is given to the party taking the manure away; in others, and for the most part, something is paid for this manure by the countryman, or filth collector, or nightman.|| By

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\* Report, p. 4.

† In Edinburgh, “where all the streets are cleansed every day, and the narrow closes several times a day, the total expense of the cleansing department is nearly 12,000*l.*, but the sale of manure yields, on the average of several years, 10,000*l.* (or  $\frac{5}{6}$ th of the whole cost.)”—*Mr. Alexander Ramsay’s (Inspector of Cleansing, Edinburgh) Letter to Dr. Playfair.*

‡ Report on Birmingham, p. 4.

§ Wednesbury, Dudley, Salop, &c.

|| In one part of Kidderminster, Duncan’s Buildings, the open privy was cleaned about twice a-year, and the contents sold each time for 5*s.* which was given to the women. There being there 10 houses this amounted to 6*d.* each. “In Bilston the necessaries are cleared as the waggoner comes, without pay, order, or method, in the day-time.”—*MS. Note.*



this method, or rather want of method, it would be seen that these places are not cleared at any regular periods, or by the same parties, or by persons furnished with proper carts with covered flaps, barrows, or other necessary implements. A whole court or alley is not cleaned at the SAME TIME, much less all the courts on the same side of the street; whereas, under proper regulations, one dirty day and one journey of the waggon might often do for all; and thus the business be done better and cheaper.\* At present the old adage is verified to the letter, "What is done with trouble is never done at all; consequently in most of these crowded courts no cleansing takes place, and the privies, ash-holes, and manure-heaps are not emptied or removed till they have long been full, or overflowing, and a nuisance for some time to the vicinity. It is the interest of the party purchasing to get as much as possible, with as little trouble as he can, for his money; he therefore constantly puts off coming for his bargain from day to day; whilst the neighbours and lamenting housewives vainly complain of his delay.

In some cases the landlord of a small row of houses retains the contents of the place of refuse and ash-hole, &c., for himself; if so, the matter is not mended, as it is never cleared till choked up, and then in the same way before described. I believe the consequences of this neglect (which prevails generally in all the towns visited) to be most injurious to the health of the people—to be inimical to cleanliness, decency, and habits of self-respect, so beneficial to all classes. I feel assured that much discontent and many disputes hence arise; that many working men, finding their homes surrounded by nuisances, leave them for the public-house; and that to children brought up amid these scenes of neglect and dirt, it is extremely difficult, if not impossible, to teach customs of order and neatness, so essential to their improvement, and especially so to the female sex.†

On visiting these neglected places, and remonstrating sometimes with the inhabitants on the dirt around their dwellings, I have been answered by their saying, "It is very true, and the smell in summer is enough to breed a fever; but what can we poor people do, who are only here for a time? there is no drain, and no convenience about, and the landlord will do nothing." Others again reply, "What's the use of my sweeping up or making clean? none of the others will, and it's no use my trying alone."

In many of the neglected courts and obscure places in these populous towns there are collections of refuse, dung, and dirt, brought in from the highways, and heaped up in some corner till sufficient for sale.‡ There being no authority carried out to prevent this, one neighbour does not like to complain of another, and the offensive matter remains

\* Night-soil is so removed by public scavengers at night in Edinburgh, vested by Act of Parliament as police property. The Inspector of the Cleansing Department thus expresses himself on this head, "If there be any point which I should wish to impress upon you strongly, it is this, If you allow private individuals to remove night-soil, it will never be regularly or efficiently performed."—*Letter from Mr. Alexander Ramsay to Dr. Playfair, Replies, &c.*

† We have the concurrent testimony of all the intelligent clergy and medical men in all the places visited to these points.

‡ Gloucester, Shrewsbury, Chester, Potteries, Newcastle, Wolverhampton, Bilston, &c.

undisturbed. In some of these towns the contents of the common sewers are collected in stagnant reservoirs or mud-holes, in the midst of a crowded neighbourhood, to be sold as manure;\* in others, the fluid contents are dammed up, to irrigate meadows or gardens in the close vicinity of the town, exhaling a pestilential smell in hot weather.†

In none of the towns visited are there any regulations for securing the proper construction or ventilation of the narrow alleys, streets, and courts in which the poorer class reside. The entrance is constantly under a narrow archway, and the place is built up all round, so as to be little visited by the sun or air. The older buildings are generally the worst; but many new ones are lamentably crowded, and constructed without reference to the health or eventual convenience of the inmates.

One instance of this may be mentioned, viz.—That, owing to the vast majority of the courts being much too narrow for a cart, all the rubbish, manure, night-soil, and ashes, must be wheeled out in barrows, or carried out in baskets by hand; and all the coal or other fuel, and all furniture, must be conveyed into the courts in the same way, causing thereby a great increase of trouble, delay, and expense, and attended with great additional annoyance to all inhabitants of the courts and passengers in the streets.

The construction of the privies, ash-pits, and other conveniences proper for the humbler class of houses in these populous places is often very defective, and frequently a disgrace to the community. Sometimes one necessary is *public* for 10 or 12 houses, and therefore neglected by all; often so placed as to be seen by all, almost always having the vault open to the air.‡ Many houses and whole rows of houses have no privies at all; and in some places the inhabitants, even of tolerable habitations in other respects, are reduced to the most disgusting expedients.

Medical men and all thinking persons will unite in opinion that such circumstances are most injurious to the health and well-being of the working classes, and most prejudicial to the moral habits and feelings of decency, especially among the young.

In general the drainage of Birmingham is good, but the narrow streets and courts are neglected, and several parts of the parish of Aston are without under-ground drains.§

\* Case in Shrewsbury, Wrexham, and Burslem.

† This occurs at Newcastle-under-Lyme and Chester.

‡ With reference to this subject I find the following notes made on the spot, in different places:—

“Courts full of full privies, open, with sad stench.”—*Birmingham*.

“Courts with pigs, middens, and open privies; bad water.”—*Birmingham*.

“Open privies; water as green as a leek.”—*Birmingham*.

“Courts uncleansed; open privies.”—*Edgbaston-street and Dudley-street, Birmingham*.

“Choked-up privies and dust-holes overflowing.”—*Wednesbury*.

“Filthy open privies and stagnant liquid filth.”—*Wednesbury*.

“Green, stagnant, stinking puddles, open privies, ample sources of fever.”—*Wild-court, Bilston*.

“Open privies, open drains under houses, stench dreadful; ‘Enough,’ said the women, ‘to bring the plague among poor folks.’”—*Birch’s-buildings, Bilston*.

“None of the houses in courts have under-ground drainage, very few any privies.”—*Wolverhampton*.

“Privies terrible.”—*Wolverhampton*.

And so, more or less, through all the towns visited, except Stourbridge.

§ The mortality per cent. in Birmingham, as given by the Registrar-General’s



Though the supply of water is generally good, yet complaints were frequently made in those parts inhabited by the humbler classes of the inadequacy of the supply and the indifference of the quality; the pumps being sometimes injured by surface-water soaking in, and frequently being out of repair, and neglected by the landlords who provide them.

The drainage of some parts of the town is much impeded by obstructions from mills on the river Lea, described in the Report before quoted.\*

There is no public walk at Birmingham, and such is much wanted. The schools for the poorer classes are indifferently ventilated, and require improvement.

There is no place in Birmingham or the vicinity where the working classes have permission to bathe; a matter much needed.

For farther details on these and other points of local information, I can refer to the Report before quoted, to my own notes made on the spot, and to the replies to the Questions circulated by the Commission, from which one or two extracts are given.†

Query 4, as to obstructions to Drainage.—“The greatest obstruction is Duddleston mill, which backs up the water in the river for about a mile, and causes it to be stagnant; into this stagnant water the main drainage of the borough empties itself, and remains to ferment, presenting a pestiferous surface of white scum, from which a noxious effluvium is exhaled.”

“No regular plan is adopted for emptying necessaries, nor is there any summary power in any of the local Acts to enforce sanatory regulations; consequently many of the necessaries are frequently in a very offensive state.”—Reply to Query 9, by Mayor and Local Committee.

Reply to Query 19.—“It will be seen that the powers of the several Boards are extensive, but in many respects inadequate.”—*Vide also General Report on Sanatory Condition*, 8vo., 1842, p. 305.

After Birmingham, the towns of Wolverhampton, Walsal, Dudley, Bilston, Wednesbury, and West Bromwich, were visited and examined; in all the neglect adverted to as existing, respecting the habitations of the working classes in Birmingham, was found to exist in a still greater degree; and their health and comfort to suffer in consequence. The three first towns, Wolverhampton, Walsal, and Dudley, are remarkable for favourable situations as regards excellent sites, dry soil, and facilities for drainage, and also a good natural supply of water; but these advantages have been much neglected for want of due regulations for drainage, cleansing, and other necessary public improvements.

I had the advantage of visiting Wolverhampton after reading the

return for the years 1840—1842, appears to be 2·7, but the return of the registrar of the district, Mr. Knight, gives a mortality for 1841 and 1842 only, of about 2·5, including the General Hospital and Union house, but varying in different parishes.

\* Communication from Captain Vetch, of the Royal Engineers, as to the obstructions to drainage, &c. in Birmingham.—Report on Sanatory State of Labouring Classes in 1842. Appendix, No. 5, p. 387.

† “As respects lighting and paving, the borough is under three distinct bodies of Commissioners, under local Acts of Parliament, and four distinct Boards of Surveyors, appointed under the provisions of the general Highway Act.”—*Reply of Local Committee*.

able Report on the state of that town by Dr. Delane, to which I can refer, and whose statements I am able to verify in almost all points.

“Wolverhampton,” says that Report, “notwithstanding its great increase during the last 50 years, still retains, in the arrangement of its streets and the buildings adjoining to them, all the evils of ancient times.” In speaking of the dense population congregated in close courts and alleys, the Report continues:—“In the formation of these buildings everything has been sacrificed to secure a large pecuniary return; they are of themselves often of the very worst construction, and in immediate contact with extensive receptacles of manure and rubbish.”\* “A great disregard to decency exists in connection with all these dwellings; many of them having only one privy allotted for the use of several families, an arrangement obviously tending to unhealthy as well as immoral results.”†

To this I may add, that, as regards the courts, alleys, and narrow streets where the poorer classes reside, the drainage is for the most part neglected, or very indifferent. No system of cleansing is adopted; nuisances are not removed; and the supply of water, though good in some places, is very insufficient in others. Many of the courts are in the most filthy state, full of stagnant puddles‡ of fetid water; neglected privies with open vaults, pigsties, and heaps of manure on all sides. The main streets seem well attended to; but there is no public walk, or any place where the working classes are permitted to bathe near the town.

The mortality of this populous place is high, being 2·8 per cent;§ and, after seeing the neglect which prevails, and which it does not appear the authorities have power to correct, there is reason to fear that the rate of mortality would have been still greater but for the admirable site and great natural advantages of the place|| For additional details I would refer to the Report before quoted on the state of the town.

Walsal and Dudley are both admirably situated on declivities, with all advantages for drainage;¶ but the remarks made on the state of the courts and alleys in Wolverhampton, will also apply to many in these towns, though their general character is certainly better. Never-

\* Report, p. 3.

† The replies of the authorities and Local Committee to the queries of the Board are probably rather too favourable on some points; but the following are extracts:—

“Query 6. What are the regulations for drainage?—None: the old streets are, the new streets are not, there being no controlling power before the houses are built.

“Query 11. Are there any local regulations in force for systematic drainage, or amendment of defective sewers?—No. The refuse lies on the surface in the poorer streets.

“Query 16. Are the courts and alleys, &c, cleansed?—Not done at all. The supply of water is very deficient; altogether inadequate for the prevention of fires. Dear and good.”—*Replies of Local Committee.*

‡ Fevers are not prevalent, but occur in those parts of the town where sewers are imperfect, or not introduced at all.—*Reply of Local Committee.*

§ By the registrar's return it appears to be 2·9 for the average of 1840, 1841, and 1842, the population having increased from 24,710 in 1831, to 36,382 in 1841.

|| The town is about to apply for a new local Act; very much needed indeed.

¶ “There are no general regulations for draining the town or district.”—*Answer from Committee at Dudley.*



theless, the same narrow entrances to close courts are found; the same ill-constructed privies with open vaults; often surrounded by heaps of dirt and pigsties; whilst the courts are unpaved, channels undefined, and cleansing neglected.\*

In Dudley, notwithstanding there is a water company who profess to give a good and cheap supply, there are great complaints among the poorer class both of the cost and quality of the water, and many cannot get it at all, as the pipes do not reach them. The cost they say is 16s. a-year for the smallest houses, besides 2l. per house to lay down piping; in consequence they buy from the Castle spring at a halfpenny per pail, and a halfpenny more the carriage of it; and in another populous district, near Salop-street, the people said, "the water was very bad, and it was above a quarter of a mile to the spring."† In other places full of the working classes the same complaints were repeated, and their "hard case and loss of time lamented."†

There is in the vicinity of Dudley a fine walk, called the Castle-walk, belonging to the Lord Ward, and, till lately, permission used to be given to the people constantly to walk in it, to the great advantage of their health. Owing, however, to the misbehaviour of a few persons, or some other cause, this walk has lately been shut up, to the great injury of the inhabitants. It is earnestly to be desired that, under proper regulations to maintain order, this valuable privilege may again be accorded to the inhabitants of Dudley by the noble proprietor.

The schools for the poorer classes are not ventilated in an improved manner. The play-ground in Stafford-street is very small, and no provision made for a supply of water.

With respect to Walsal, I may also say, there is no efficient system of drainage except in the principal streets. "The weir for a mill pounds up the water back in part of the town, and the stream below is full of stagnant filth, and is quite inadequate to carry off the dirt brought down by the sewers. There is a bad stench in summer."

The race-ground near the town would be a good place for the play-ground and public walk, but I was told that it is lammas land, with a right to the Earl of Bradford to float and cut hay between January and August, and exclude the people then.

There is a fine walk and view from the churchyard high above the town, but it has been shut up lately by order of the vicar, as it was said, on account of some irregularities. If re-opened under *proper regulations* it would afford a healthy walk.

Bilston, Wednesbury, and West Bromwich are three populous places, situated on the high road between Birmingham and Wolverhampton, and may be considered as varied specimens of the state of other towns and dispersed groups of houses, inhabited chiefly by the poorer classes, occupied in and about iron and coal mines, in the great Staffordshire coal-field. This district reaches from beyond Stour-bridge, in Worcestershire, to Walsal, comprehending a very densely

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\* "Few of the houses of the poorer classes have proper necessities, as they are usually allowed to remain in a filthy state, with the contents overflowing the contiguous yard so as to present a mass of filth. Many are without doors; few are arranged so as to open into drains."—*Answer of Dudley Committee to 8th Question.*

† Notes—Dudley.

peopled country of from 12 to 15 miles square, and inhabited probably by not less than 200,000. The towns of Hales Owen, Oldbury, Rowley Regis, Brierley Hill, Tipton, Sedgeley, Willenhall, and Darlaston, belong to this division, all of a somewhat similar character as regards the poorer people and their habitations.

Wednesbury consists of one long street, along the turnpike-road, with many lateral ones branching into courts and alleys, inhabited by the working classes. There is no drainage worth the name, no scavengers or system of cleansing, and the supply of water very scarce and indifferent. There are no pipes (though there is, it is said, a good supply near it, at a high level above the town), few pumps, and the wells are often bad.\* "The people complain much, and have to carry water near a mile, or to buy at a halfpenny for three cans."

The workhouse for the town has very bad water in the well, and they are obliged to fetch it for washing or drinking several times a-day. The courts, alleys, and small streets are unpaved or ill-paved, full of stagnant puddles, privies with open vaults, pigsties, &c.;† there is, in fact, no care taken on these points, and the greatest neglect appears. I find it stated, "There is a dreadful stinking tank or ditch at the back of the Turk's Head, where the magistrates always meet, and the public enter by this filthy place."‡

The reply of the Local Committee to the queries of the Commissioners states, "The facilities for drainage are remarkably good;" and continues, "there are not any public drains,—such drains are very desirable in this parish." In another answer to the question 16, "If the courts and alleys inhabited by the poorer classes are cleansed by appointed scavengers," they reply, "No; consequently they are in a filthy condition."§ There is no place where the working classes are allowed to bathe, nor any public walk or place of exercise.

The British and Foreign School, with 140 children, was badly ventilated, few of the windows open at the top. There is a pretty good play-ground. The mortality of parts of this town is said to be no less than four per cent., and the increase in 10 years from 1831 to be 33 per cent., showing that a high rate of mortality is not inconsistent with a rapid increase of population.

Having seen the neglected state of the poorer classes in Wednesbury, we might hope to find an improvement in the neighbouring town of

\* Notes.

† The following entries appear:—

"Whitehouse-square—Filthy choked-up privies, and dirt-holes overflowing.

"High Bulleyn—Open drains, full, and stinking.

"Ledbury's-buildings—Filthy open privies; stagnant liquid filth and receptacles; bad water generally; opposite court, bad privies.

"Houses opposite Turk's Head—Open receptacle of liquid filth."—*MS. Notes.*

‡ Notes.

§ Report of Local Committee, query 16.

Such notices as these are frequent in our notes on the spot: "Filthy open privies, no water, no drain."

"Green stagnant puddles."—Miss Webley's court.

"Open terrible drains; no water but by buying."—Bullock's-fold.

"Open privies, pigsties, filth and ashes;" "Open drain, full of filth."—Buck's-buildings.

"Three had the fever in our house (said a woman), one died; privy full, filth verflows."—Workhouse-fold.



Bilston, but this is by no means the case; on the contrary, the courts, alleys, and streets occupied by them are in a still worse condition than in Wednesbury, and we cannot but consider them a disgrace to the country. The town of Bilston was a few years since stricken with a visitation of cholera, more dreadful in its ravages than any place in the kingdom, owing, doubtless, in great measure, to the neglect of cleanliness which prevailed there. There is now a building, bearing in large letters the word "Cholera School," raised by subscriptions for aid of the orphans of that calamitous period. Great exertions were then made for improvement in cleansing and ventilation, and we might have hoped that so severe a warning would not so soon have been forgotten by the people themselves or the authorities of the country. At present the places inhabited by the poorer classes are as much neglected as ever;\* the courts, alleys, and small streets are not inspected or cleansed, and are for the most part in a disgraceful state—injurious to the health of the people, and destructive of all habits of decency and self-respect. In one point they are better off than in Wednesbury, as there is a water company from Dudley supplying part of the town and the richer classes with water. Nevertheless, I heard many complaints; and the reply of the Local Committee states (Q. 32), "The poorer classes are supplied chiefly from pump or draw wells, and by supplies fetched in pails from the water-engines, often at a *considerable distance and by begging*;" and again, "where there is no such supply (from the company), which is *mainly the case*, complaints are universal."†

The town possesses tolerable advantages for drainage, but "there are not any regulations for draining the town or district,"‡ the only drains being one or two in the main streets, whilst the most crowded districts are totally neglected. "There are several courts within courts with no sewerage, and the surface-drains very bad and stagnant; no cleansing, no privies, but with vaults open to ashes and rubbish; stench always bad. The inhabitants have no water but what they buy at a halfpenny per pail, or fetch a long way. All the worst places might easily be drained by small branch culverts leading to those now in the main street near."§

The mortality has been stated to be as high as 3·4 per cent. on the population, and in bad places 4·5 per cent.—a fearful consequence of neglect. The general mortality, however, on an average of three years, 1840, 1841, and 1842, was stated by the superintendent registrar, Mr. Payne, of Wolverhampton, as 628, being 3·1 per cent, and one of the highest of any town in this vicinity. The population has increased from 14,490, in 1831, to 20,180, in 1841, being an increase of 33 per cent., or one-third in 10 years. During this rapid increase, no proper regulations for health, decency, or comfort, seem to have been attended to!

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\* Of court owned by Miss Hill—"Filthy state; stench very bad; terrible throughout; from 30 to 50 families with children live here; no water; very bad open privies."

Green Craft Hall-court—"Very bad, no fall or drain."—*MS. Notes.*

"Price's-entry and six courts in Temple-street—very bad; pig-wash very bad smell, worse than privies."—*MS. Notes.*

† Report of Local Committee.

‡ Report of Local Committee.

§ *MS. Notes.*

West Bromwich, a few miles from Birmingham, has one street of good houses along the turnpike-road, with adjacent small streets and courts; the rest of the people (near 27,000 in number) are spread over a large parish, in mining villages, or groups of houses built with little regularity. The streets in and near the town are tolerably well laid out; but many have never yet been paved.

There is no drainage, or any regulations for it, or for cleansing any of the places where the working classes reside. The alleys, small streets, and rows of small houses are quite neglected; puddles, filthy open drains, pigsties, and open privies are seen on all sides.\* The stench from many of these is so bad in summer that the superintendent of police said, at night he changed his road to avoid them, or stopped his nose in passing. The population, however, is not much crowded together, from the dispersed situation of the different groups of dwellings. If, owing to this circumstance, the effect of this neglect of all sanitary regulations is less injurious to health, still it is very hurtful to all habits of decency and cleanliness, especially among children and the female sex.†

There is no supply of water, but from wells and some pumps; the water is sometimes indifferent, and the pumps often out of order.

The same state of things prevails, says the intelligent inspector of police, and as I can partially confirm, in "all the adjacent populous parishes inhabited by the same classes. Some places are worse than others, but all, except in the main streets, quite neglected."‡

The West Bromwich National School appeared dirty, and in indifferent order, with the windows broken, the privies full, and the ventilation bad, and little neatness about it; there was a play-ground, but very damp and neglected.

This populous place has, however, one advantage scarcely found in any other town similarly situated. A benevolent proprietor, the Earl of Dartmouth, has reserved a field of about four acres, which is walled round and kept in order. This he lends at different times of the year, for the use of the poorer inhabitants, at wakes and festivals, who enjoy themselves, under the management of a committee of subscribers, in athletic sports, races, and rustic exercises. They and their families assemble in crowds, proper rules are established, and no disorder occurs; whilst thousands enjoy their harmless holiday. Some raised seats are erected for the committee, and a card of the pastimes, which are suited to the humble classes, is printed beforehand. A small subscription is entered into for prizes to the competitors. I have reason to believe this nobleman adopted this plan to wean the people from bull-baiting and other cruel amusements, by substituting something better in their place. He seems to have succeeded completely in his laudable object; and I earnestly hope his example may be followed by many others,

\* Row out of Moore-street, 11 houses—"Privies full and open; bad water; no drains; pig-close; no ash-holes;" poor woman says, "the smell has made her bad many times."—*MS. Notes.*

Elsewhere, "stinking cesspools," &c. &c.

† "A large portion of the liquid refuse is thrown into the water-courses, and in many instances remains stagnant on the surface, which is very offensive."—*Local Report.*

‡ *MS. Notes.*



being convinced that, by a little considerate kindness towards the workmen, and by providing for them some occasional harmless amusements, they might be led from meetings prejudicial to them, and from drinking-shops, which are now their only resorts for any excitement.\*

Before leaving this outline of the towns in the Great South Staffordshire coal-field, it is agreeable to be able to except from the complaints made the town of Stourbridge. This place, with a population of above 7,000, is, in its general aspect of cleanliness, and in improved drainage, a favourable contrast to many of the towns before described.

There is a local Act, with powers for paving, draining, lighting, and cleansing, and its provisions seem well attended to, though defective on one or two points; even here, however, there is no mode adopted for clearing away all filth and refuse from crowded places by *contract*, and enforcing cleanliness upon a regular system.

The night-soil and ashes are only removed by farmers, who purchase them from time to time, and the smaller streets and courts are imperfectly cleansed, by order of the Town Commissioners.

The supply of water is tolerable from wells and pumps; but many of the people, where the water is hard, are obliged to purchase soft water from water-carts, at a halfpenny for five or six gallons.

This town contains many opulent inhabitants, and its general aspect is that of improvement. There is, however, no public walk or place for exercise; no place where the poorer classes are permitted to bathe; and our intelligent informant, in replying to the question as to the state of the schools for the labouring classes, says, "There is a great want of play-ground for the children; the want of it forces them into thoroughfares, and to trespass on private property."

In the immediate vicinity of this neat and flourishing town is a large straggling and populous hamlet of King's Swinford, called by the appropriate name of "Lye a waste." These waste people are almost all nailors; their houses, or rather huts, are of all forms, grouped in two, three, or more together, over a wide space. Filthy open ditches, heaps of rubbish and dirt, surround their neglected habitations; disorder and poverty appear on all sides; there are no regulations or attempts at improvement.†

*Kidderminster.*—The populous town of Kidderminster is situated within a few miles of Stourbridge, though not belonging to that class of towns we have been describing. It is at some distance from the mining districts, and the inhabitants are chiefly occupied and supported by the manufacture of carpets. As, however, it is in this neighbourhood, it may be well to give here a short account of the state of it.‡

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\* By an account of the West Bromwich wake sports in 1843, it appears the whole cost did not exceed 18*l.* 10*s.*, which was raised by subscription; this included prizes for foot-ball, various kinds of foot-races, and other sports, adapted to amuse the working classes.

† It is said that these persons were most of them enfranchised for votes for the county in some contest of past times.

‡ The following are extracts from notes on the spot:—

"Some very bad places, narrow courts up close entrances, bad surface-drains, stagnant filthy cesspools in gardens—Queen-street back and front. Jerusalem, Mouth of Nile—bad. Pantile-row—very bad cesspool. New-street—fever. Courts on west side of Mill-street—very bad narrow courts, obliged to stoop to enter; damp and trickling with foul drain, the only outlet; open privies."—*MS. Notes.*

This town has many natural advantages, being situated on a declivity, with the river Stour passing through it as a ready drain; the soil is a porous sandstone, and the water supplied from wells is generally good and plentiful.

The streets where the richer classes live are open and well-drained; but the small streets, alleys, and courts, inhabited by the working classes, are much neglected, and are in want of drainage and cleansing; the rain water, together with slops thrown from the houses, often lying in stagnant puddles in the ill-made surface gutters.

The privies in all such courts and entries are constructed with open vaults, into which ashes and refuse are thrown; they are frequently full and overflowing, and causing a noisome smell; seldom are cleaned or attended to, one often serving for several houses. They are never cleansed regularly, and must, with the dirt collected round the houses and the cesspools, which are not unfrequent, be the cause of loss of health in many cases.

I visited and examined, in company with an intelligent medical gentleman, the worst parts of the town, and he stated his strong opinion, that the health, comfort, and morals of the poorer classes in all these neglected districts were much injured by the evils before described, and which the powers of the local Act were entirely ineffective to remove.

These points, together with some obstructions to the drainage, are stated in a candid spirit in their Report by the authorities and principal inhabitants of the town, who appear desirous for improvements, and anxious for powers to effect them.

The answers given by the Local Committee to three of the most important questions framed by the Commission will show the state of many parts of this populous town, and are as follows:—

Q. 8. "Have the houses proper necessities, &c. &c.?—A. The necessities are usually common to many houses; they open into cesspools *uncovered*, and are a constant source of putrid exhalations, the *frequent cause of fever*, and some of the greatest nuisances in the town."

Q. 11. "Are there any local regulations in force for the systematic drainage of the district?—A. There are local regulations under the Act, but no systematic drainage; such as the drainage is, it is defective, and occasions the accumulations of refuse, and the emission of offensive smells."

Q. 16. "Are those courts and alleys which are inaccessible to carts, and inhabited by the poorer classes, cleansed by appointed scavengers, &c.—A. It is never done, and there are no appointed scavengers."

After these statements, it would be useless to extend our description;

"Tan-bank, back of Waterloo-street—filthy open stagnant ditch from privies. Daddle-brook pounds up gardens and cellars in Blackhall-street and Swan-street. Nailors entry and narrow entries. Blackhall-street—very bad indeed, privies open, bad stench, pigsties, filth, &c.

"Entries in Mill-street—very damp. Duncan's-building—privies common to many, open to view, disgraceful state, cleaned irregularly by sale, 5s. for 10 houses, sold three weeks since, never fetched by farmer. Cursfield and the Batteries—two rows of small houses, nasty open gutter and bad smell, have plenty of fall.

"The square Bowdley-road—open privies, heaps of filth, muck-holes full, well of water between two muck-holes.

"Some houses are built back to back in Pantile-row, and some other streets and courts are closed up at the end."—*Reply of Local Committee.*



but I may add—there is no water company, or service by pipes! the school-rooms for the poor are generally indifferently ventilated, and have no play-grounds; the necessary vaults open and often offensive!\*

I now have to state the general condition of three towns in North Staffordshire—Burslem, Hanley,† and Longton,‡ where the people are chiefly occupied in the potteries; and of Newcastle-under-Lyme, an ancient town of the same vicinity. These towns have all some points in common, which may be first noticed; and their points of difference will be afterwards noted. The three pottery towns§ are of comparatively recent date, having risen and increased with the trade which chiefly supports them. They are built in an irregular and rather dispersed manner, on moderate declivities affording good fall to water, and have the advantage of the houses not being packed close together; and sometimes gardens, or intervals of unoccupied land separate groups of dwellings. The principal streets are tolerably wide and open. On the other hand, these towns bear all the marks of their recent origin; they have no sufficient powers by Act of Parliament for adequate drainage,|| cleansing, or the removal of nuisances; and the condition of the courts, alleys, and narrow streets, where the poorer classes reside, is in almost all these particulars greatly neglected, to the injury of their health, and the destruction of their comfort and all habits of decency. ¶

\* “St. George’s National School is well ventilated, but badly warmed and no play-ground; open privy; stench dreadful in hot weather, says a boy. Girls school well warmed by stove, privy bad.”—*MS. Notes.*

† The following comparison of the mortality of two districts in the township of Shelton (part of Hanley) is of much interest:—

*Comparative Mortality of two Districts for Six Years, from August 1, 1837, to August 1, 1843, from the Registrar’s Account; sent by J. B. Davies, Esq. Member Royal College of Surgeons, London.*

No. 1, including Hill, John, and Albion streets, parts of Lechfield, Bethesda, High, and Broad streets, Bagnall, George, and Cannon streets, containing in June, 1831, 839 inhabitants, being well-drained, ventilated, and kept clean, and pretty well supplied with water: deaths, in six years, 85 persons.

No. 2, including King, Queen, Princess, Castle, New, Cambridge, Oxford, and Buck streets, containing 921 inhabitants in 1841, being badly drained; ventilated; houses much crowded, always dirty, badly supplied with water; deaths, in six years, 171 persons, reducing the population of No. 2 to that of No. 1: deaths stand (in No. 1) 85, in No. 2, 156, or nearly double, i. e. above 3 per cent. per annum.

‡ In Longton there is a good supply of water from reservoirs through pipes, “but no regulations for draining, except those by the surveyors of highways under the general Act. There are no public scavengers. A large proportion of the liquid refuse is thrown into the water-courses; it either soaks into the subsoils or remains stagnant on the surface.”—*Report of Local Committee.*

§ “In Hanley the water brought by pipes is of very indifferent quality; purer water is brought in water-carts and sold at a halfpenny per pailful. Good water is much wanted, and might be had from a pure spring at Washerwell.”—*Report of Local Committee.*

|| The principal streets in Hanley are drained under the Highway Act only; there are no regulations for the draining of the back streets, courts, or alleys; behind the dwellings of the poor there are generally open drains to carry off the surface water and refuse from the houses, which the occupiers of land use for manuring the meadows; this occasions a great nuisance.”—*Report of Authorities.*

¶ “Burslem—Old and New Bag-street and courts very bad; open privies, filth overflowing; causing, said the people, a sad stench in summer.” “Navigation-

The same remarks as to the want of attention to the state of the lower orders may be applied to the ancient town of Newcastle, placed in a very advantageous position, and having many local advantages. Though the authorities have a local Act for cleansing and improving the borough, and by the Municipal Corporation Act the town-council act as Commissioners to carry it into effect, little is done for the health or comfort of the large majority of the poorer inhabitants. The main streets are generally open and well drained, but there are many narrow entries, alleys, and courts, quite neglected.\* Some new streets of sufficient width are unpaved and undrained; and although the water is generally good in quality, frequent complaints were made by the poor women, that the public pumps, from which many were supplied, were out of order,† or gave an inadequate supply. Part of the town is supplied by pipes, and the whole might in the same way be easily furnished with this indispensable necessary at a moderate cost, from an unfailing source.

A few extracts from the returns of local committees will exemplify the state ‡ of these several places, and some matters peculiar to each.

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street—Bad, open sewer in front,” &c. &c.—*MS. Notes, confirmed by the report of the Local Committee and Chief Constable.*

There is no drainage but under the Highway Act.

\* Back of Friars—“New filthy open privies, cesspools, pigsties; very bad.” Back of Corn-street—“Bad open drains, to float meadow with sewer water.”—*MS. Notes.*

† Public pump in Pump-street, higher land—“out of order for a fortnight till now. Drayton-street sadly plagued for want of water for weeks from pump.”—*MS. Notes.*

‡ Burslem—“Daniel’s-row—filthy open drain. Hole Houses—very damp, open dirty drains. Filthy open mud-hole, near Old Church, receiving sewers and filth in a populous neighbourhood, for manure.”—*MS. Notes.*

“Great complaints of want of water near Old Church, obliged to carry it from spring, a quarter of a mile off, and scant supply there.”—*MS. Notes.*

“Hanley is cleaner than Burslem; Swan-street and Chapel-fields unpaved; no drain; damp courts; open stagnant drains.”

“Marsh-street—All complain of want of water; no water company as at Burslem; water purchased at a halfpenny a pailful; filthy open drains close to houses; foul ditch near houses dammed up for irrigation.”—*MS. Notes.*

“There are no regulations for draining back streets, courts, and alleys; the only regular scavenger is the rain.”—*Report of Local Committee.*

“Longton—Gallamore’s-bank; small houses, very bad open privies; refuse in heaps; puddles; no channels; water plenty; 2d. per week.” Back of Flint-street and George-street no drain.

Mayer’s-court—many small houses; open filthy drains and puddles; open privies. New Bridge-street and Waterloo-street, very bad.

“Mayer’s-passage—filthy open drain; many complaints. Green-dock, very bad. Paradise-row, bad cesspools. Daisy-bank—filth, pigsties, &c. Chillock’s-lane—open drain. Meat won’t keep.”—*MS. Notes.*

Newcastle. Back of Union-street—open filthy privies, running over into the street. Pump-street—open stagnant drain; choked; many complain it was so for three months. Courts at back of Pump-street—very bad; open privies; stagnant water. Cross-street—lower side overflowed from rain; no drain. “Drayton-street—very bad;” so Mill-pool, filthy drain, enters in front of the barracks.—*MS. Notes.*

Newcastle. Lower-street, back of lodging-house—filthy places; cesspools, &c. Court—upper side “very bad.” Second court very bad; filth running down the passage. Blue Ball-entry—open privy; choked drain; dry pump. Courts Breeches-square, very bad. Back of Old Churchyard—open drain; very bad. Back of Holborn—“Open rivulet, receiving filth and drains in the midst of the town.” Court near “side,” soughs stopped; landlords do nothing.”



None of the pottery towns have any open or public walks, or any places where the working classes are permitted to bathe. These towns are in one point superior to the mining towns, as the vaults of the privies are generally, however imperfectly, covered over, which is seldom indeed the case in the latter. There are many small gardens let to the working classes, near Newcastle, and they enjoy the rare advantage of some good public walks, well laid out, and planted in its immediate vicinity. These want some stone benches. The National School of the town, with 232 boys on the books, is very close, "and wants ventilation very much," according to the statement of the master. The girls' school also requires improvement. Those conveniences necessary for health and cleanliness were much neglected at the boys' school. The mortality of Newcastle, notwithstanding its many natural advantages, is near 2·8 per cent. on the population, probably owing in a great measure to the want of proper regulations before described.\* The chief employment in this place is the manufacture of hats, which has long been established there. The population in 1841 was about 10,000, having increased from 8,500 in 1831—about 16 per cent. in 10 years.

I now proceed to give a short account of the state of some county and other towns situated at considerable distances from each other, and having no particular common character. They are not dependent on any single manufacture, and may probably be considered as fair samples of the older English towns. Shrewsbury,† the county town of Shrop-

Newcastle—Fine spring wells, want cleaning, road and stone work round want improvement. Dung-heaps and gathered manure in all courts and waste corners in heaps.

Filthy open privy at alms-house, filthy court below, open filthy ditch across Bridge-street, a principal street. Bath-street—back yards bad, open privies, pigs; all streets unpaved. Hayle-street—back courts and yards "very bad." Princess-street—not paved, bad drain.—*MS. Notes.*

Newcastle—All on the Stoke-road without drains and badly off for water. Fever near Hartshill church from want of drains. Gaswork-road—courts in Bath-street very bad, privies, pigsties, &c. Corporation house in Penkull-street—back premises a nuisance, full of filth. Yard of Golden Lion—large open cesspool in the heart of the town, &c.—*MS. Notes.*

Back of London-row—"privies full, ash-holes, sad stench."—*MS. Notes.*

"There are no fixed regulations for draining the town, consequently many parts of it are without public sewers, the filth allowed to accumulate in courts and alleys.

"In the modern-built parts of the town, where no sewers have been constructed, the refuse and slops are thrown into the water-courses."—*Reply to Questions by Mayor and Local Committee.*

\* An intelligent inhabitant says, "The refuse from the houses is flung into one promiscuous heap contiguous to each property, and removed when it is incapable of receiving more." The same respectable authority says, "there are now 600 Irish in the town," (most of the lowest class) and he remembers as a youth when there was only one in the place, in an English family.—*Mr. Mayer's Letter.*

† Shrewsbury—Connal's Lodging-house, Castle Foregate—"pigs at back," cesspool, no drain, privy very bad. Dykes-street—"bad, no drain." Evan's-street—"filth, refuse, &c., in open dirty heap, full, no drains." Beacall's-street—no drain, offensive smell from pigsty. Bagley Brook—at back of houses open, very bad receiving sewers.—*MS. Notes.*

Edward's buildings—drain from street under passage of house, "smells dreadful," say women near; "cannot live in the house for the smell; worse than a privy."—*MS. Notes.*

shire, is situated on the Severn, which serves as a natural drain to it. The more ancient and principal part of the town (which was formerly walled round, and of considerable strength) is placed on a gentle elevation of the red sand-stone, with the river flowing almost round it in form of a horse-shoe, so as to possess every natural advantage for

Castle Foregate—"No under-ground drain over most of this populous district; slops thrown into the street.

John's-row—Front houses, "the privies *are earthen steins emptied once a fortnight into ashes in front*, close to the public road. No soft water without buying it."

Castle Foregate—Clay-pits, houses low and damp, privies full, and so for six weeks; "prevent them," say poor women, "eating their food below stairs."

Jones-row—"Sough stopped, filth enough to breed a fever."—*MS. Notes.*

Back of Dolphin-row—"Open filthy sough, pigsties, sad stench;" culvert at back not opened. "No pipe-water higher up, though much needed."—*MS. Notes.*

Brocas's-buildings—"Stagnant cesspools at back of full privies, overflowing, very bad indeed; no regular clearing of privies, ashes, or refuse; old man, T. Horner, clears at a penny per barrow, and mixes it at top of the garden, close to the road."—*MS. Notes.*

"Bad smell from gas-water in the scum on surface of Shropshire canal, passing through part of the town, kills the fish for a mile, owing to the washing of the gas-works being permitted to escape."—"Bad open ditch near Oswald's houses." Row near Canal Tavern—"bad open drain."—*MS. Notes.*

Castle Foregate.—Birch's Buildings, 12 houses—no drain; open channel, choked with filth, coming into road, "*privies with tubs carried out from time to time.*"

Hayledine's-square—"Bad surface-drain, &c. &c. Various other places in a neglected state."

Back of British and Foreign School—"Filthy open drain, midden, and offensive pigsties," one close under the window; privies want improvement; also ventilation of girls' "school," floor damp.—*MS. Notes.*

Public walk from English Bridge towards Castle quite neglected, broken up, and ruinous; if well kept, of great beauty and utility, being "close to the river."

Coleham—Many places neglected. Mrs. Poole's buildings—Filth deposited in open drain, very bad; privies emptied with tubs once a fortnight into Severn; dirt and slops thrown down in the court; "no neighbour is healthy, there is a bad smell in all weathers," says one poor woman. Factory yard—full of filth, pigsties, &c.; many small houses, *no water but from Severn.* Back Coleham. Hayledine's-houses—Privies overflowing; no drain; very bad smell; many other neglected places of a similar kind.—*MS. Notes.*

Shrewsbury—Barker-street, Hart's-buildings court—full privies, very bad; drain from above brings filthy water into open place; the people complain bitterly of the stench; no water. Shipper's-street, ditto. No sewer in Claremont-street, Hill's-lane, or Belmont. Taylor's-buildings, out of small close passage entrances to seven houses, very bad; *no water, no privies, no ash-holes*; filth and slops thrown into open channel; poor inmates complain sadly of the stench; slaughter-houses and most offensive heaps of dung and offal close.—*MS. Notes.*

Mason's-street—many small houses; bad open channel; no ash-holes; no water but carried from the river. Sheep's-head-street—12 houses. King's-head-street—several; no water; no privies; no ash-holes; both in a disgraceful state. Carnarvon-lane—nine houses, "utterly without conveniences of any kind, or water." Frankwell—Rookery, seven houses; "open filthy privies, choked; open drain and cesspool, enough to breed a fever; no water; many complaints. Other neglected places, but not so bad."

Opposite Circus-row and near 30 houses in St. Austin's-row is a large open receptacle for the filth brought down by the common sewers, called the mud-holes. It is kept in a stagnant state to be sold for manure, though the river is close with a good fall. This is a dreadful nuisance close to a public walk, and injurious to a considerable neighbourhood.—*MS. Notes.*

Courts in Foregate-street—privies full; open vaults; pigsties; ash-holes full; authorities never cleanse courts or small streets. "The women complain much of the dirt and smell."—*MS. Notes.*



being kept clean. It has, however, beyond the river four suburbs, reaching along four different roads, being outlets from the town. One, called the Abbey Foregate, chiefly consists of good houses in one wide street, and is kept in good order. The others, called Frankwell, Castle Foregate, and Coleham, are, in great measure, inhabited by the working classes. A small part of each is occasionally liable to be flooded by the Severn (a mountain river) or its tributaries, and all of them are much neglected as regards drainage and cleansing. A good supply of water, found in the centre of the town, through pipes laid down by a company, only extends partially to the suburbs. The main streets are wide, and have a good declivity; but a great portion of the most populous part of the place is lamentably in want of improvement, and the inhabitants suffer severely for want of it. Some of the answers to the questions of the Commission, drawn up by an intelligent committee of inhabitants, under the sanction of the mayor and town-clerk, will give a general description of the main points:—

Q. 6. "What are the regulations for draining the town?"—A. "There are no general regulations for draining the town, and none whatever as to the suburbs." "The suburbs of the town are not under-drained, as also portions of the town." "There are several open ditches in the suburbs from which noisome smells arise." "Very many of the dwellings of the poorer classes have no necessaries, and it is a source of very great discomfort to the poor, injurious to their habits and feelings, and occasions a great public nuisance. Even the better class of houses are inefficiently supplied." "There is a service of scavengers who cleanse the streets within the walls, but do not go *into the suburbs, nor into the courts and alleys.*"

The evils arising from this state of neglect were amply shown on visiting the district in question. Many complaints were made by the poorer inhabitants as to the want of the means of decency and cleanliness round their dwellings, of their health in some cases suffering from these causes, and of the insufficient supply of water they received from the pipe service; and in other places their difficulty of procuring it at all. Many of these evils might easily be remedied with proper exertion, though additional powers are requisite to enforce and keep up adequate improvements.

This town has the advantage of a fine public walk, adorned with fine trees, and beautifully situated on the banks of the Severn. The population of this town is 18,285; in 1831 it was 21,297. The mortality, including, however, the County Infirmary, is 2·6 per cent., which might be much diminished with proper precautions.

Chester, the county town of Cheshire, is finely situated on a site of moderate elevation, on the banks of the river Dee. It has many natural advantages, which, if properly used, would cause it to be a healthy city. At present, owing to the neglect which prevails as to drainage, cleansing, and a good supply of water to the poorer classes, the mortality, including the County Hospital and Gaol, amounts to no less than 3 per cent., being higher than the neglected district round Wolverhampton. There is no particular manufacture carried on here; but this place is the town of supply to a large and opulent district round it. The same neglect which has been described as prevailing in Shrewsbury and other places,

as regards the narrow streets, alleys, and courts inhabited by the working people, prevails in Chester. In several of the principal streets there is no effective drainage. There are stagnant cesspools and ditches of an offensive kind in several places; open privies, overflowing with filth, are often seen; churchyards crowded with bodies are situated in the midst of the town; and the supply of water is often inadequate and dear. It appears useless to report in long detail the same evils which we have seen set forth in other towns, and which exist here in all the more crowded places where the poor dwell. A few are mentioned in the notes.\*

The schools for the children of the working classes partook of the general character of those visited, varying however with the intelligence and zeal of the managers and committee. I find the following account in my notes on the spot; though the answers of the local committee was of a more favourable kind, as was frequently the case. I am able to add, that the authorities and intelligent inhabitants evinced every desire for improvements, and have lately made considerable exertions to effect them.

\* Chester — Whitehouse-court, Swan-court, &c. — quite neglected; stagnant ditch; pavement full of puddles, filth, &c.; three pigsties.—*MS. Notes.*

Love-lane and courts—Open privies; stagnant ditch; no drain or water. Union-street—Courts into, very bad; slops in channel; filthy open ditch, plenty of fall. In Boughton—Open drains; manure in open street; filth in puddles; no water.—*MS. Notes.*

Stephen-street—no drain, no water; bones and filth collected; full of Irish; *fever always prevails, causing great expense*; open drain by canal near Russel-street. George-street—"Open privies, filth, manure, pigs; stench, &c. very bad indeed." George-street and William-street, New Town—Not paved or drained; never visited or cleaned. Yard for collecting bones is a great nuisance.—*MS. Notes.*

Back of George-street—"Open stagnant drain overflows the yards of all the houses." Back of Brook-street—Bad place near Wamburgh Churchyard. Row of houses near—bad state. Northgate-street—No drain; slops and water from water-closets pumped into the open street at night. Stagnant ditches on Tower-field and race-ground. Wall's-lane—"No drain; dirty; very sickly." Heaps of manure close to houses.—*MS. Notes.*

Tower-fields—"An open, fetid, stagnant ditch, receiving many sewers close below the Gaol, Infirmary and Stanley-place (full of the best houses); it is pounded up to float with; the smell at times very bad." Bad courts at back of Trinity-street—cesspools, &c. Various close courts—very bad state. Britton's-entry—court within court; "very bad indeed; 'there are many more,' says the registrar, 'the same.'"—*MS. Notes.*

Blue Coat School for boys—Badly ventilated; four windows out of six only open a sixth part at the bottom; good play-ground; bad open privies. Consolidated Day-school—"115 girls; privies small, very bad; ventilation and warming imperfect." National School, Girls—"Fire-place for a stove; very cold or hot; windows don't open well; roof not plastered."—*MS. Notes.*

Diocesan National School—"170 boys; fine rooms, not plastered on roof; wants ventilation and stoves; no play-ground; privy open, drain and urinal dirty." British and Foreign School, supported by Lord Westminster (near 400 children)—"Good school-rooms, well ventilated by windows. Girls' school rather cold in parts in winter; privies, open vaults, require to be covered, and have drain; play-ground wants a little sloping and draining; and a pipe and cock to each play-ground, with a chained iron ladle to supply water."—*MS. Notes.*

Harrock's-entry, Bridge-street—"very bad state." Noake's-court—sad state; very populous; women complain much. Boarding-school-yard, Bridge-street—privies, &c., in a shameful state. Holles-stréet and Clare-court—not very bad privies; pig's filth; stench. Old Quarry, Northgate-street—stagnant long cess-pool full of filth, &c. &c.



The population of the city of Chester appears to have been—

In 1841, above 24,000,

In 1811, 17,472.

The mortality (including however the Gaol and County Hospital,) amounted in 1842 to 720, or 3 per cent. The poor-rates correspond with this high rate of mortality, being between 4*s.* and 5*s.* in the pound.

Wrexham, a borough and county town of Flintshire, in North Wales, was visited as a sample of such towns in the principality. I regret to have to report so much neglect of all necessary precautions for the health, decency, or comfort of the habitations of the poorer classes. Instead of going into details, which will only be a repetition of what we have seen the case in other places, it appears better to give the answers of the Local Committee\* to some of the most important questions of the Commission. The committee describe the bed of the small river flowing through the town "as obstructed by gravel and rubbish, and flooding the neighbouring cellars and main drains to a considerable extent." That this obstruction is "chiefly to be attributed to five dams erected within the township in the last 40 years, and is daily increasing. There are no regulations for drainage, except those vested in surveyors of highways. The whole of the filth on one side of the town is conveyed into a meadow in the town, where large open ditches are cut for its reception and retention in a stagnant state, and from which an abundant exhalation of miasmata arises. There are no proper decent necessities belonging to the houses of the lower classes, and the state of those which do exist is most disgraceful and offensive."

There is no service of scavengers; no cleansing the courts or alleys where the poorer class live; no supply of water but from wells and pumps, and this often complained of. "Many of the lower classes collect dung and filth from the roads, and keep it up against their houses for sale, which is only removed once a-year."

Owing to the natural advantage of having a good fall, and the people not being so crowded together as in the larger towns, this place has not so large a number of annual deaths per cent. in the population as might be expected. It must be, however, almost unnecessary to remark, that the moral habits, comforts, and decencies of life of the poorer classes

\* This committee was assisted by one of the magistrates of the county and the vicar of the town, and comprised some of the most intelligent and influential inhabitants.

Gitton's-yard, York-street—pounded-up filth received from drains; this, kept in the middle of the town for manure, "brings 1*l.* per annum; costs *three times that* in doctor's bill," says the inmate. "Hence fever." Edwards's-yard—same thing here, cesspools and filth. Inmate says, "*never without sickness.*"—*MS. Notes.*

Yorkshire-square, and various other places—open drains, bad privies, manure and filth heaped up close to houses; "privies overflowing." Inmates complain, "Cupboard smells so bad, it's of no use."—*MS. Notes.*

Dirty pigsties and cesspools in many courts; women complain of the stench. Barnham-yard—13 houses, midden, and privies full; bad smell; no water. Welch-entry, seven houses—"very bad; no drain; no water," &c. Cutler's-entry, ditto, &c. &c. &c.

Burre brook runs through the town, receives all sorts of drains and filth, is never cleansed; there is a bad smell in summer, the bed is wide and straggling, full of rubbish, gradually choking up.—*MS. Notes.*

Want of water often complained of; National School badly ventilated; other improvements wanted.—*MS. Notes.*

are greatly injured by the circumstances described ; and that the health of all classes suffers likewise. The poor-rate is stated to be very high, viz. 4s. 6d. in the pound. The mortality appears to be 2·4 per cent.\*

Gloucester is finely situated in the vale of the Severn, for the most part on a moderate acclivity, and well placed for drainage. This however is very little attended to ; and all the poorer parts of the town, as regards sewerage, cleansing, the regular supply of water, and the removal of nuisances, is greatly neglected. The answers of the local authorities and committee to questions submitted to them were as follows :—“ There is no general system of drainage.” “ In many parts of the town there are several stagnant pools and ditches, the receptacles of filth and refuse of all sorts, very injurious to health, in some of the most crowded parts of the city.” † “ In many parts of the town there are no proper necessities, often but one to ten or a dozen houses : they are frequently allowed to overflow.”

With respect to the courts and alleys being cleansed, it is replied, “ In some parts the soil and refuse is brought out to the public scavenger. In other parts, amongst a dense population, it is allowed to accumulate near the houses, and is afterwards sold for manure.” The consequence of this neglect was witnessed throughout all the poorer parts of the town in the same disgusting scenes that have been described in various other towns. Many streets and courts are without pavement, drains, or cleansing.‡ One large stagnant ditch, called Dockham ditch, receives the filth from a populous vicinity, and is never cleansed, but allowed by its stench to corrupt the air, and spoils a good open public walk in the meadows near. This town has a fine supply of water, by pipes at a high pressure, but it is not carried to many populous parts of the town.

The return of the registrar shows a high rate of mortality :

The population in 1831 was 13,686,	
and in 1841 was 14,869.	
The mortality in 1840 was 447, or 3 per cent.	
„	1841 was 393, or 2·6 per cent.
„	1842 was 430, or 2·88 per cent.
Average of three years, 423, or 2·8 per cent.	

Some allowance is to be made for the County Infirmary within the city. To this indifferent account of the state of Gloucester we are sorry to add, that on some flat ground belonging to the corporation, but beyond the borough, and at some distance from the town, a suburb of very poor houses (of one story only) are fast building, close to a filthy full ditch, and without any drainage or regulations to preserve health. The evil

\* By a return from the Registrar-General it appears to be 2·4 per cent. on a population of 11,960, which includes some rural districts.

† Answers 6 and 7. “ Norman’s-row—close court, very bad state. Out of 90 inhabitants, 30 died when the cholera was here.”—*MS. Notes.*

‡ Kay-court, Glasshouse-yard, and many courts in the island, and on each side Leather-bottle-lane, are in a most filthy, neglected, and unhealthy state.—*MS. Notes.*

Clear-street and courts adjacent, Sweetbrier-street, Milk-street and courts out, and various other places, are in a filthy and disgraceful state. The “ stench and dirt in one populous place, called Reform-court, belonging to a retired tradesman, was enough to breed a fever.”—*MS. Notes.*



consequence of this must in a short time be apparent ; and the police already complain of the predatory habits and bad example of many of the inhabitants.

I was enabled, besides visiting and examining closely the large towns before described, to look into the state of Droitwich in Worcestershire, Wellington in Shropshire, and other small towns, and am sorry to be obliged to report that great neglect of proper sanitary regulations prevails in all of them to the great injury of the inhabitants. In almost every one of the smaller towns there is some suburb or assemblage of miserable and neglected dwellings, the constant abode of fever or other disorders.

It is matter of remark also, that in many of these places a colony of poor Irish have planted themselves, who are *fast increasing* in numbers : their habitations are habitually dirty and neglected ; the frequent source of disease ; and the inhabitants are generally from their frequent quarrels, and the bad example they afford to others, a great trouble to the vicinity.

The general state of the poorer classes in large towns and populous districts, as affected by the state of their dwellings, and the offices and conveniences belonging to them, is a matter of increasing interest to the country, and will more and more force itself on our attention.

From the statements made and inquiries instituted, it is evident the health and comfort of multitudes are greatly dependent on a good system of drainage, cleansing, and an ample supply of water ; all subjects beyond their control, and chiefly resting on laws or municipal regulations, which it seems the duty of a wise and benevolent Government to superintend and enforce.

It may, I think, be demonstrated, that as the health, and consequently the power to labour, of the poorer classes is injuriously affected by the absence of proper provisions on these points, that thereby their support from poor-rates or otherwise is thrown on the other classes ; it seems to follow, that judicious enactments on these just causes of complaint would eventually be found measures of true economy, and would repay, with compound interest, the necessary outlay to the country at large.

Laying aside, however, the important consideration of the health of these masses of persons, I would venture to submit some reflections on other injurious consequences to the community, which seem to arise from neglect as to the points alluded to.

In visiting and examining the state of many populous towns, both during the inquiries instituted by the Commission of Health, and on former occasions, I have observed how much the moral habits, the domestic manners, and the general demeanour of the poorer classes, are influenced by circumstances immediately around them ; and by nothing more than the comfort or discomfort, the cleanliness or want of cleanliness, of their dwellings. This will be evident on attentive observation ; and I feel confident that the absence of the decencies of life, and the constant presence of disgusting and dirty objects, gradually destroy the moral feelings of the people, and render them brutal, reckless, and drunken. The working man, returning to his home, (which is often surrounded by dirt, with no provision for drainage or cleansing,) affected by the smell, and having no water for his use, readily resorts to the spirit-shop or public-house, where, in short-lived indulgence, he forgets

his troubles. The woman, neglected and peevish, visits on her children, or her husband on his return, her vexation, and thus domestic brawls ensue.

Amid such scenes the children become hardened, careless of cleanliness, unused to order; and all the benefit derived from the best education which may be given is destroyed by the constant evil examples they see round their homes. This is especially the case with the female sex, who, if early tainted by the disgusting scenes existing in the places described, and by the want of all decency and self-respect there exhibited, become at a future day the nursing mothers of vice and wretchedness, instead of inculcating the household virtues. I wish, however, independent of these considerations, of the loss to the country from the inferior *value* of such persons as labourers, workmen, and artizans, from their want of docility, perseverance, and industry, to represent the cost and danger arising from multitudes increasing every year, who have no homes which they value, and no feelings of interest to bind them to the institutions of the country. These persons, having no property themselves, have no respect for the property of others; and thus we find increasing numbers, reckless in habits and conduct, ready at all times to join in disturbance and discontents, whether of a general or local nature, and requiring an augmented constabulary force to keep in order, and an additional vigilance to restrain.

In all disorders which have taken place from time to time in any of our populous districts, we shall find the neglected classes described constantly swelling those meetings or mobs which have caused uneasiness to all other classes, and have been the source of great *cost* to the country.

I feel firmly assured that, as a matter of true economy, and, above all as a matter touching the peace and safety of the country, it is absolutely necessary for Government to take some effectual steps towards removing the evils described. The crowded and neglected state of the dwellings of the poorer classes in populous places, productive of so much evil, and exercising so injurious an influence on their characters and conduct, appears to have arisen from circumstances greatly within our control, and to be mitigated, if not removed, by well-considered regulations.\*

The cause of this state of things appears to be the rapid increase in our town population within the present century, and the absence of any general rules as to the construction or easements of houses erected;

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\* An abstract of the state of 51 of the principal towns visited by the Commissioners, and where the annual mortality on an average was the highest, was made as "bearing on the public health, and the condition of the poorer classes of the people." The main points inquired into, viz.:—1. Sewerage; 2. Cleansing; 3. Supply of water; were divided into good, indifferent, bad, and gave these results:—

	Good.	Indifferent.	Bad.	
Sewerage . . .	1	7	43	} Powers generally insufficient, and frequently neglected.
Cleansing . . .	2	7	42	
Supply of Water . .	6	13	32	

These towns comprise the seats of all the chief manufactures of the kingdom, together with the four principal seaports (after London), and contain a population exceeding three millions of persons.



and as to sewerage, cleansing, and the supply of water, as regards the poorer classes.

By the population returns, it appears that the number of manufacturers and workmen living in towns was to the labourers in country districts as one to two in 1790.

In 1841 the proportions are exactly reversed, and the numbers of the former are to the latter as two to one.

In 40 years, from 1800, agricultural labourers have increased from 40 to 45 per cent., whilst workmen in towns and manufacturing district have augmented 120 per cent., and in great towns much more.\*

This rapid increase will be found chiefly in the manufacturing districts; and since the improvement of the steam-engine, and its adaptation to machinery, our principal manufactures are all carried on where our beds of coal are found.

The increased demand for workmen in these districts called for additional dwellings, which have been erected, or *run up*, as the phrase is, in many instances with extraordinary celerity, and with *no regulations* to ensure those conveniences which are necessary for the health and comfort of the inmates. The great majority of houses for the working classes thus built are the property of small capitalists, tradesmen, and others living on the spot, who only desire to make the largest interest on their money. Some are erected by building clubs, who are generally led by the same motive. Thus rows of small houses are built by contract from time to time, the main object in almost all cases being to pack as many dwellings as practicable on any given quantity of land, and to build them at as little expense as possible, consistent with their being let; consequently there is very little outlay on any of those conveniences, which, though conducive to the comfort and decencies of life are not essential to existence.

Most of these small capitalists and proprietors of houses live on the spot, and superintend the property by themselves or their agent, receiving weekly or beforehand the rents from the inhabitants. Although some may be led by different motives, yet, as a general rule, it may be safely said, their only object is to make the highest interest they possibly can, without looking to any other consideration.

I fear it may be shown, that as a mere matter of profit, (to a callous collector of rents,) that the poorest and worst class of habitations pay the highest interest, as the reckless and improvident always pay the highest prices. Thus, often the tramper's lodging-house, the low brothel, and the poorest class of dwellings, pay to a stern and unscrupulous owner the highest returns. It is true the returns are made from the pillage of other classes, or *indirectly* taken from them through the medium of poor-rates or alms; but this is not thought of by the small capitalist, with no scruples to check him, and no laws or regulations to interfere with him.

It will generally be found there are few persons of education or considerable property resident in these crowded districts; with the exception of persons belonging to and busily engaged in the learned professions, and master manufacturers, few others remain.

If the houses of the working classes are built by, or belonging to

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\* Abstract of Population Returns.

master manufacturers, as is sometimes, but not very often, the case, they are almost always of a better class, and with more conveniences about them than those before described; in such case, however, workmen are not always free agents to work for whom they please, and to make the best bargain they can for their labour.

It has been observed, and constant experience in all the districts examined confirms it, that there is a natural tendency, arising from self-interest among the small capitalists for whom the poorer kind of houses are erected, to prefer a low class of cottage dwellings to those of a better description. Exceptions will always occur, but this will be found the general rule.

It requires forethought and consideration, and a strong feeling in favour of decency and cleanliness, (that is, just the virtues which great masses of the working classes in these neglected places *have not*,) duly to estimate the value of efficient drainage, proper conveniences to their houses, and a good supply of water always at hand. Thus, their want of the decencies of life prevents their requiring them, and not being provided, their children are brought up in the same degraded state. This seems exactly the case in which the judicious regulations of a benevolent Government should be carried out to assist them.

Independent, however, of the tendency which exists in these populous places, among small owners, to prefer an inferior to a better class of dwellings, there is, in the existing state of the law and practice, as regards poor and other local rates, a direct inducement to such persons to desire an indifferent instead of an improved kind of houses as investments.\*

Under the old Poor Law the rents of many of the poorest houses were in some districts paid out of the poor-rate. But in almost every place the lowest class of houses, partly through the inefficiency of the law, and partly through the difficulty of enforcing it, pay scarcely any of the local rates, including the poor-rate. In some places they are exonerated by local Acts,† in others excused, and in all the impracticability of collecting the trifling rate to be levied on each inhabitant prevents its being regularly enforced. If attempted, the constant excuses of the poor inhabitants, and their uncertain tenure, prevent the collection, and little is to be had unless by trouble and cost, exceeding the value of the rate! In this manner, this low class of dwellings becomes virtually exempt from burthens paid by those of an improved character. Thus a premium equal to whatever is the amount of the rate is added to the interest of capital laid out in this lower class of tenements, and is quite sufficient to operate against building such as would pay less interest by having the rates deducted from the rents, or the rents lower in conse-

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\* In Chester, all houses of a low rate are exempted from paying to police rate; and in many places there are scales of payment, giving lower rate to a lower class.

† Thus, in Wolverhampton houses from 4*l.* to 7*l.* annually are rated not exceeding 6*d.* in the pound.

From 7*l.* to 10*l.*, 9*d.* in the pound.

From 10*l.* to 15*l.*, 1*s.* ditto.

From 15*l.* to 20*l.*, 1*s.* 6*d.* ditto.

From 20*l.* to 30*l.*, 2*s.* ditto.

From 30*l.* and upwards, 2*s.* 6*d.* ditto.

*Vide* Local Act for Wolverhampton, 54 Geo. III. June 17, 1814.



quence, which is the same thing. This is a bonus given for a *bad* set of dwellings, whereas it ought to be for a *good* set.

In some places, indeed, by local Acts, the owners of tenements under a certain annual value are liable to the rates (with a certain allowance) instead of the occupiers; and this ought to be the case under the general law, and would remove one inducement now held out to continue and extend these miserable houses.\*

A measure of this nature has been recommended in the Reports of the Poor Law Commissioners, frequently suggested by local petitions, and was strongly supported by the Report of a Select Committee of the House of Commons in 1838, on a general Act of this nature, which was laid before them, and on which much evidence was heard.†

I feel fully persuaded that a measure founded on this principle must be the groundwork of improvement in the neglected districts described, and that without it, however they may be made better for a time, they will soon sink into their former state.

It seems demonstrable that there cannot be two rates of interest in the same country at the same time, and that if from a negligent practice under the law, or the fault of the law itself, or from any other cause, we exempt a low class of buildings from burthens or rates paid by a better, we thereby draw and direct capital towards investment in these miserable tenements, and multiply their numbers beyond what would be the case if the rates fell equally on each.

But we have seen by the various reports of different towns and districts, and by statements derived from authentic sources from various quarters, that other things being equal, the rate of mortality in any place is ordinarily regulated by the number of these wretched neglected dwellings;‡ and that the number of destitute, discontented, and depraved persons is nearly in the same proportion.

I have endeavoured to describe some of the evils arising from the want of proper sanatory regulations in many of these crowded and neglected places. They may be summed up as follows:—

1st. Shortening the duration of the lives of the community.

2nd. Disease, suffering, and inability to work on the part of many who survive; the causes of great cost to the country.

3rd. Crime, theft, and the loss of property, which the police constantly point out as arising from these neglected classes.

4th. Riots, disturbances, and drunkenness, which may generally be traced to the same class of persons, often to the same places.

5th. Great injury to the education of the poor, which is constantly neutralized in its good effects by the neglect and evils they see around

\* General Report on Sanatory Condition of Labouring Population, 1842. "Impolicy of exemptions," &c., p. 229.

† It seems perfectly practicable, as it would be also politic and just, to make provision that the repayment of any money raised for improvements should be spread over a certain period, and repaid in such a way as would cast on each proprietor or lessee of the property a proportion equivalent to his interest in it.—*Vide* Report on Sanatory Condition of Labouring Population, 1842. The evils arising from the difficulties in rating the occupiers of such tenements, is the injustice arising from it to other classes, as well shown in the Report of the Poor Law Commissioners on Local Taxation, 1844, pp. 58, 59, 60, &c.

‡ *Vide* the General and Local Reports on the Sanatory State of the Labouring Population, and the various Reports of the Commissioners from local inquiry.

them. The same observation applies to the inestimable advantages of religion, and attendance on religious worship.

6th. Great discontent in some, and sluggish apathy in others, producing recklessness of conduct, indifference, and want of attachment to the institutions of the country.

7th. The loss to the humbler classes of the cheapest, best, and most enduring pleasures, viz., those arising from the kindly influence of the domestic relations between husbands and wives, parents and children, brothers and sisters—that pure source of happiness derived from mutual kindness, attachment, and good offices, is, amid the hardening and disgusting scenes described, almost destroyed.

It is proposed to calculate shortly the *present* cost to the community, arising chiefly from the causes before noticed. Minute accuracy cannot be pretended to, but I fully believe the general result may be depended on. We must also bear in mind that the moral evils arising from the pollution of the mind, the hardness of heart, and all the bad passions found to prevail in the worst of these neglected places, *cannot be measured by matter of money*; neither can the long sufferings of broken spirits, bent down to misery, and yet remembering better days, be gauged by any pecuniary calculation.

Amidst these scenes of wretchedness, the lot of the female sex is much the hardest. The man, if, as is usually the case, in employment, is taken away from the annoyances around his dwelling during the day, and is generally disposed to sleep soundly after his labours during the night; but the woman is obliged to remain constantly in the close court or neglected narrow alley where she lives, surrounded by all the evils adverted to: dirty children, domestic brawls, and drunken disputes meet her on every side and every hour. Under such circumstances, the appropriate employments of a tidy housewife in brushing, washing, or cleansing, seem vain and useless efforts, and she soon abandons them.

The average rate of mortality in one of the best parishes in the west end of London, well attended to in most respects, does not exceed 2 per cent., per annum; whilst that of one of the worst and most neglected parishes of the east end is about 4 per cent., or double the former: farther, the average duration of the lives of labourers and their families in one parish is 26 years, and in the other only 16 years.\* Thus, after an equal expense of time in each to rear any one through the perils of childhood, his strength and intellect is available towards repaying the cost incurred 10 years longer in one case than in the other.† This no

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\* The average ages of death of the poorer and working classes are shown to be as follows in 1840:—

Kensington Union . . . . .	26 years.
Bolton Union . . . . .	18 „
Bethnal Green, London . . . .	16 „
Liverpool . . . . .	15 „
Leeds . . . . .	19 „
Rutlandshire . . . . .	38 „

*Vide* General Report of Sanatory State of Labouring Classes, 1842, p. 159.

Wherever the mortality per cent. is great, the average age of the living is much lower than where the mortality is low, as well shown in the able Supplement to Mr. Chadwick's Report on Interments.

† *i. e.* The existing population have less experience, skill, knowledge, and power to labour, than if the mortality be low.



doubt is an extreme contrast, but it is clear that as the annual mortality for several of our large towns is found to be near 3 per cent. on the population, we are understating the truth in saying that the mortality of the poorer classes alone in most of our populous cities may be reckoned at 4·2 per cent. ; but we know that with proper regulations experience has shown it ought not to exceed 2·2 per cent., which is about the average of healthy towns. In these neglected districts the mortality is therefore 2 per cent. higher than it ought to be, and might be with proper care ; or in other words, the duration of life, instead of nearly reaching 26, would be limited to about  $16\frac{1}{2}$ , showing a diminution of the life of each person of 10 years one with another.\*

We have seen that the loss of life will, in this case, be 10 years to each person belonging to the labouring classes or their families. Thus, suppose the average duration of life to be 16 instead of 26 years. In a town of 20,000 in population the annual deaths will be, at 3 per cent., 600 instead of 400. Of these at least 500 persons from the poorer classes would thus be deprived of 10 years of life in the strength of their age. Now we cannot reckon the value of the labour of such persons at less than 5s. per week, including males and females ; this for a year would amount to 13*l.* each, which, for 500 persons, makes up the sum of 6,500*l.* per annum lost to the community, owing to this premature mortality. This is not all ; it is calculated that for every person who dies from any of the causes described, at least two others suffer from illness for a considerable period, though they recover.† We must, therefore, calculate the cost of the illness of 1000 more of the inhabitants of the town in question, which may be considered as lasting four weeks each, and disabling them from their usual employments. If the same value is reckoned for their labour as the others, this will amount to a loss of 1,000*l.* per annum. An equal sum at least must be added for their maintenance during illness, with medicine and advice, which will be an additional 1,000*l.* per annum in some way deducted from the community.‡

It may be difficult to state with accuracy the loss to the town or district caused by crime arising from the evils described and enumerated as the third head of expense. The degradation and suffering found in these poor districts have a permanent effect on the conduct and character of thousands, lessening exertion, relaxing self-restraint, prostrating the feelings of decency and self-respect, and hardening the sufferers against remonstrance or advice. From much consideration I am led to believe at least one-half the amount of crime found to exist in one of these crowded and neglected towns arises directly or indi-

\* Allowing for deaths in infancy.

† It appears by the evidence of Dr. Southwood Smith, taken before the Commission in 1843, that in the London Fever Hospital not more than one in seven die ; and that fever arising from neglect of sanatory measures, is peculiarly the disorder attacking those grown up, and the heads of families ; those attacked between 20 and 30 years of age exceeding those of *all other ages* together, on an average of four years and 2,537 cases.—*Vide Evidence*, p. 71.—15th June, 1843.

‡ It is estimated that every person in the fever hospital at Glasgow loses six weeks' employment ; and the cost of attendance and support, *where the party recovers*, is calculated at 1*l.* per case.—*Report on Sanatory State of Labouring Classes about the Metropolis, &c.*, p. 6.

rectly from this want of proper regulations to prevent the evils before depicted.

Now let us apply this calculation, with all reasonable allowance, to a town of 20,000 inhabitants with a mortality of 3 per cent. The cost of the crime and vice of 4,700 vicious characters residing in Liverpool, with a population of 220,000 persons, and a mortality of  $3\frac{1}{2}$  per cent., was calculated at 700,000*l.* per annum.\* Liverpool being six times the population of the town we are considering, one-sixth would be the proportionate cost of crime if the rule of proportion only were followed. This, however, it is evident would be a great overstatement—

1st. Because the mortality of Liverpool greatly exceeds the town in question, whence we may infer greater distress, degradation, and vice.†

2ndly. The proportion of population between a very large and a moderate-sized town is not a rule to be depended on.

3rdly. Liverpool being a seaport of great wealth and great transit of goods, property there is liable to more than ordinary pillage.

Instead, therefore, of considering the cost of crime in the smaller town as one-sixth, or one-seventh that of Liverpool, amounting to 100,000*l.* annually, let us deduct one-half on account of the population not being so dense, leaving 50,000*l.* And again, let us halve this sum to allow for the greater mortality and wealth of Liverpool, leaving 25,000*l.* Let this sum again be halved to keep quite clear of exaggeration, and we shall have left 12,500*l.* per annum as the cost of 300 or 400 idle or vicious characters in the town in question (of 20,000 persons) preying on their neighbours.‡ These will include a proportion of vagrants and other vicious and idle characters constantly circulating through all our populous districts.§

I have before stated my conviction, that where the mortality amounts to 3·2 per cent. in such a town, one-half the cost of vice and crime may be attributed directly or indirectly to the evils before depicted. We shall then have an annual loss of 6,250*l.* every year, arising from these causes, in the town we are contemplating. If we are to include the expense and loss arising from drunkenness|| consequent on the points of neglect referred to, we shall greatly increase the pecuniary loss to the community whose state we are considering.—The account then

\* *Vide* Report of Constabulary Commissioners, p. 18. This estimate being thought extravagant, was submitted to the close scrutiny of a local committee, and found to be *below the truth*.—*Report of the Statistical Society of Liverpool. Report of Commissioners on Constabulary Force.*

† The number of depredators, offenders, and suspected persons, amounts in Liverpool to 1 in 45; but in the city of Bath is 1 in 37; in Bristol 1 in 31; and in Newcastle-on-Tyne 1 in 27.—*Report of Constabulary Commissioners*, p. 13.

In each of these towns the mortality among the *poorer classes* is very high, especially in Bristol, where it exceeds 3 per cent for all, and in Bath, where being 2·6 for all, it must exceed 3 per cent. for the poor.

‡ 400 persons at 10*s.* per week, one with another, would amount to 10,800*l.*

§ *Vide* Report of Commission on Constabulary Force.

|| It was calculated by competent authority, that 10 years ago every person above 12 years of age consumed on an average one gallon of spirits per annum, but now a gallon and a half.—*Colonel Sykes—Transactions Statistical Society of London.*

The quantity of spirits consumed appears by returns to have *trebled* in 20 years, whilst the population *increased one-third*.—*Vide Returns.*



will stand thus with reference to such a neglected town, with a population of 20,000 persons and an annual mortality amounting to 3 per cent. :—

Loss of the labour of those prematurely cut off, as before stated, per annum . . . . .	£ 6,500
Loss during illness of those who recover . . . . .	1,000
Their support in illness . . . . .	1,000
Cost of crime and vice arising from the same causes stated	6,250

Total per annum . . . £14,750

If to this annual amount of cost arising from these causes we add that of drunkenness and the outlay in spirituous liquors, we shall find it fearfully increased. It is calculated that the amount of spirits annually consumed in England amounts to one gallon per head on the whole population, and is sold retail at about 12s. 6d. per gallon; taken, however, at 10s. it would amount to a cost of 10,000*l.* per annum in a town of 20,000 persons.\* At least half of this may be laid to the account of the causes adverted to, and would add to the 14,750*l.* already stated 5,000*l.* more each year.

I have here said nothing of the cost of excesses and loss of time in consequence, or of the cost of constables, police, prosecutions, and gaols; I have added nothing for the heavy payments made by the middle and humble classes for funeral expenses of their relatives prematurely carried off by the mortality described.†

I feel confident that adding these additional items of cost to those I have already noted, the whole may at the least be estimated at 20,000*l.* per annum in the city described of 20,000 inhabitants, with a mortality of 3 per cent.;‡ and I feel assured that a similar calculation may be made, and will be found below the truth, for every town and district in the kingdom in the same state. We have then a city ill-regulated, neglected, and unhealthy, where the consequences of this neglect, and the evils engendered by it, cost the community (independent of the discontent, degradation, and wretchedness thereby created) the sum of 20,000*l.* per annum, or 1*l.* per head annually on the whole population; and it remains to try whether by due regulations and sanatory improvements, at a much less annual cost, we cannot work out a state of things of quite a different aspect as regards the physical and moral state of the great body of the people, and as regards the annual rate of mortality, which will be a plain criterion of their alteration for the better. If we reckon the number of persons as five to a house in such a town, we should count 4,000 houses. These in such a place may be rated, one with another, at 10*l.* per annum, giving a rateable value of 40,000*l.* per annum; the cost, therefore, of the neglect and evils described, will

\* Whether, according to the respective habits of different districts, the parties in question indulged to excess in spirits or malt liquor, will make no difference in this calculation.

† *Vide* Mr. Chadwick's able statement on that subject.—*Supplement to Sanatory Inquiry*, 1843, also Report, 1842, pp. 172, 176.

‡ It is not contended that the whole of this cost falls on the rate-payers, or even inhabitants of the town; it is shared by the persons and district around, but equally falls on the country at large.

amount to a sum equal to a rate of 10s. in the pound annually on all the dwellings in the whole town. I feel assured then that it is within the truth to lay down as a rule, that in every place where the mortality closely approaches 3 per cent., the annual cost direct and indirect to the *community* exceeds 1*l.* per head on the population, or 10s. in the pound in the rental of all houses. This vast annual outlay, together with an incalculable amount of suffering and guilt, we believe may be prevented by proper regulations, wisely directed and firmly enforced.

Some persons have taken up an opinion, that however we may lament the sufferings caused by disease, and arising from the sources described, yet that the severity of this remedy is necessary to restrain the increase of population. The fallacy of such opinions have been well pointed out in the supplement to Mr. Chadwick's Report on Interment in Towns. (App. No. 11, p. 250.) I have constantly observed wherever the mortality was high in close, narrow, neglected courts and alleys, there the children swarmed as if to fill up the places; and it has been demonstrated again and again, that a high mortality in an increasing country, only leads to a great increase of births.\* It can be shown that a high mortality is a source of additional cost and waste to the community, and compared with a place where the mortality is by proper regulations low; therefore it will follow that capital, and the power of employing labour, will accumulate faster where the mortality is low; and thence it will appear, that in such a place or country there will be a constant support and demand for a larger number of persons than where, from a high mortality, cost is augmented and the increase of capital retarded.†

The consideration of effective remedies for the existing evils described is a task which will properly devolve on the whole Commission, after due deliberation; but it may here be stated, that in all the populous towns and districts visited, the state of which is before narrated, great complaints were made of the inadequacy of the present powers and provisions for drainage, cleansing, the supply of water, and the removal of nuisances; and a strong desire was expressed for the general adoption of sanatory regulations, and some system of periodical inspection to enforce them. The necessity for some general law to watch over the erection of the humbler class of houses, the space in front of them, and the conveniences belonging to them, seemed also admitted. The expense, difficulty, and delay of obtaining local Acts for any of these purposes, and others of a similar nature, was often complained of. It must be evident, that an efficient drainage must be the first step to the sanatory improvement of these populous places. But in none of them,

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\* "The proneness to marriage or concubinage in proportion to the degradation of the parties is notorious, and I anticipated, from the fact, an abundant offspring to be carried off by premature disease."—*Rev. W. Elwin's account of Bath, in Mr. Chadwick's Report on the Sanatory Condition, &c.* 1842, p. 169.

† "The disparities in the rates of mortality, and consequently in the duration of life in towns and parishes where the climate and soil are nearly the same, must awaken attention, and prove that the present excessive mortality is not inevitable. To save the life of one human being is meritorious; but here are thousands to be saved, in every part of the kingdom, from sickness and untimely death, from the loss of children and of beloved friends, from all the sufferings, all the bitter separations which every one of these figures signifies."—*Fifth Annual Report of the Registrar-General, 1843*, p. 34.



except Birmingham, have we found any system of levels from a common datum or point laid down; and in few any effective and comprehensive plan acted on; very seldom is any skilful civil engineer employed, and the discoveries of modern science (as applicable to this subject) are generally entirely neglected; by which means the work performed is much more costly, and worse done than would otherwise be the case. In various places, and in several parts of London, the rules laid down as to the junction of drains from the humbler class of houses into the main sewers, are very unjust and impolitic, and virtually act as a prohibition. In some towns the sewer-rate is laid on without reference to any benefit derived; and in others, the lower class of houses, requiring only a cheap drain, two or three feet in depth, are equally taxed with houses having underground rooms or cellars requiring deeper and much more costly sewerage. An effective sewerage seems greatly dependent on and connected with a good supply of water; these two important departments should either we think be under the same authorities, or there should be established a complete understanding between them. From what I have learnt, I feel convinced, that if a general Act were passed, giving proper powers and facilities for the establishment of water-works, either by individuals, companies, or public bodies in populous places, that a useful investment of capital would be opened, and a considerable source of employment furnished.

Some suggestions as to remedial measures were furnished in the Report of the Committee of the House of Commons on the Health of the Poorer Classes in Large Towns in 1840; and in the Report from Mr. Chadwick on the Sanatory Condition of the Labouring Population in 1842. The consideration of this subject will form one of the most important duties of the Commission.

We learn by the Report of the Registrar-General\* that in some neglected districts of London, the annual mortality approaches 4 per cent. on the population, while in others it is only half that amount, or less; the same frightful contrast is found between the state of many of our large towns.†

The result of inquiries shows that the same difference in the rate of the pace of death exists often between different parts of the same town, and this chiefly owing to the neglect of sanatory measures within our power. Let us pause for a moment to consider this difference and its consequences, between portions of a city, one with a mortality of 2 per cent., and the other 4 per cent. In one there will be twice as many deaths, twice as many funerals, double the suffering, double the illness, double the grief of parting friends, double the sorrow of sad survivors. There will be twice as many widows, twice as many orphans; twice as many who have been cut off in their days of strength and usefulness, before they could repay to those around them the cost and care of their early rearing.

In the one case death arrives gradually in almost its natural course, when the years are told out, and the task of life is nearly over; in the other, it suddenly seizes its victims in their opening youth, in the strength

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\* Appendix to Fifth Annual Report, page 233.

† *Vide ante*, p. 208. The mortality of the poorer classes in the worst districts of some of our undrained and crowded towns must amount to 5 per cent.

of their days, or wastes them down to nothingness by varied forms of pestilence (the offspring of neglect).

What are the consequences of this difference? We shall find the rate of mortality one great criterion of comfort, therefore of contentment, of good conduct, of moral habits, of intelligence, docility, usefulness, and value.

In the one case we shall find a population having little to complain of, ready to attend to advice, having had time to learn and to think, having experience from lengthened life, and being valuable subjects, docile and industrious, possessing that chief safeguard against tumults or disorders, "the hope of improving their condition." In the other will be found a body consisting in great measure of the young, who cannot repay their support; a large proportion of the rest will be inexperienced, untaught, untried, having had no time to learn or to think. All will be more or less reckless, and hard in mind and conduct; they have been formed by the constant course of circumstances around them; poison to the mind and to the body has been the course of their only education. Their maxim will be the heathen maxim of old, "Eat and drink, to-morrow we die;" forced by their necessities to labour, experience and docility will be wanting; they will not husband their wages, but seek for excitement in intemperance, or low sensual indulgences; their consumption of spirits will be ten times that of the happier class. The gratification of their animal passions will be their chief object; illicit connections will be formed; early, ill-assorted marriages will take place, without any chance of a provision for offspring: thence will arise multitudes of sickly and neglected children, pressing into the places of those early victims just departed, and to be cut off by the same melancholy process:—and thus the scene revolves. This class will eagerly join in riots or disturbances, partly for the sake of excitement, and because they have *not* that best security for good conduct,—the hope of improving their condition.

To one or other of these classes, or to some gradation between them, the great mass of our labouring people "in populous cities pent," belong. From the concurrent testimony of all thinking persons it is now known, that the circumstances which chiefly influence in these points their "weal or woe" are within reach of well-devised legislation, duly enforced by benevolent superintendence: such a course seems called for alike by humanity and true policy.

In concluding this Report, I cannot but express my earnest conviction, that the evils described are most extensive and increasing; that they tend to depress and degrade very large bodies of the humbler classes, and will go far to account for the lamentable increase of commitments for crime of late years.

R. A. SLANEY.

*January, 1844.*



## SUPPLEMENT.

RETURNS in reply to QUESTIONS issued by the COMMISSION, 1843,  
from Committees, headed by—

BIRMINGHAM . . . . .	The Mayor, James James, Esq., and a Committee.
WOLVERHAMPTON . . . . .	D. Hill, Esq., J.P., and Committee.
DUDLEY . . . . .	— Fletcher, Esq., and Committee.
KIDDERMINSTER . . . . .	T. Hallen, Esq., Town Clerk, and Committee.
BILSTON . . . . .	James Loxdale, Esq., the Vicar and Committee.
WEDNESBURY . . . . .	Rev. — Cartwright, and Committee.
WALSAL . . . . .	The Mayor and a Committee.
BURSLEM . . . . .	Mr. D. Ball, and Committee.
SHELTON and HANLEY . . . . .	From a Committee of Inhabitants.
LONGTON . . . . .	— Young, Esq., and Committee.
NEWCASTLE-UNDER-LYME . . . . .	H. Hall, Esq., Mayor.
CHESTER . . . . .	The Mayor, Dr. Davies, and Committee.
WREXHAM . . . . .	Rev. — Cunliffe, J. P., and Committee.
SHREWSBURY . . . . .	The Mayor, J. J. Peele, Esq., Town Clerk, and Committee.
WEST BROMWICH . . . . .	Mr. Sweeting, Inspector of Police.
GLOUCESTER . . . . .	The Mayor, and a Committee.
DROITWICH . . . . .	Medical Men, and Commissioner's Notes.

	Population in 1841.	Morta- lity per cent.	Excess over 2 per cent. in Three Years.	Local Return.	
				Population.	Mortality, per cent.
Birmingham . . . . .	138,187	2·7	2,728	..	..
Aston . . . . .	50,928	2·2	..	..	..
Wolverhampton . . . . .	80,722	2·8	1,846	..	..
Dudley . . . . .	86,028	2·6	1,488	..	..
Kidderminster . . . . .	29,048	..	..	Borough and Foreign, separate	..
Bilston . . . . .	..	..	..	..	3·4
Walsal . . . . .	34,274	2·6	2,056	..	..
Newcastle - under - Lyme . . . . . }	..	..	..	{ 1831— 8,500 1841—10,000 Increase, 16 per cent.	2·8
Chester . . . . .	..	..	..		2·8
Shrewsbury . . . . .	18,285	2·6	373		{ 715, near 3 per cent.
Gloucester . . . . .	14,152	2·8	..	..	

The following Table has been transmitted from the Registrar-General's Office:—

RETURN of the Population in 1831 and 1841 ; Annual Increase of Population per Cent. ; the Deaths in five Years ; and the Annual rate of Mortality.

Sub-districts.	Population.			Deaths in Five Years, 1838-42.	Mortality.	
	1831	1841	Annual Increase per cent. 1831-41.		Annual Rate per cent.	One Death in
Shelton (parish) . . . .	9,267	11,955	2.6	1,660	2.844	35
Longton, Lane End, and Botteslow . . . . }	9,673	12,425	2.5	1,667	2.747	36
Wednesbury (parish) . .	8,437	11,625	3.3	1,432	2.538	39
Burslem (parish) . . .	12,714	16,091	2.4	1,937	2.461	41
Hanley (sub-district) . .	8,001	9,621	1.9	1,149	2.430	41
Wrexham (ditto) . . .	10,656	11,960	1.2	1,435	2.426	41
Stourbridge (ditto) . .	13,874	17,597	2.4	2,067	2.402	42
West Bromwich (parish)	15,327	26,121	5.5	2,966	2.386	42
Dudley (ditto) . . . .	23,043	31,232	3.1	3,614	2.381	42
Kidderminster (town) .	17,913	17,741	..	1,916	2.160	48

*Letter addressed to Mr. Slaney on the State of the Courts in Birmingham.*

DEAR SIR,

*Birmingham, November, 1843.*

My principal motive for now addressing you is to point out the necessity for the extension of salutary powers to the state of the level and repair of the courts as well as their drainage. Since I had the pleasure of seeing you in Birmingham I have visited 167 of the courts, with the view of ascertaining their condition in these respects ; and the result of the observations taken and recorded on the spot is that, out of that number 88 are bad, both as regards their level and drainage ; 120 are quite out of repair ; 44 are good as to their level, but bad as to their drains ; while 30 are good as to their drains, but defective in their level ; while 23 only may be said to be in a perfect state. Against many I have written the word disgraceful, and a few I have the pleasure of recording as excellent. Thus you will perceive that a court may be well supplied with drains, but these may be rendered of no avail by the court being badly levelled ; other courts will be well laid, but their drains will be defective ; while both the level and the drainage may be good, but rendered ineffectual by the state of repair, permitting large pools of stagnant water to remain after heavy rains, from whence exhalations proceed which mix with the atmospherical air, by which the dwellings of the workpeople are supplied.

The destructive influence to health of air impregnated with these exhalations is pointed out by all medical writers, but it is particularly noticed by Sir John Pringle, in his work on diseases of the army, and also by Sir Gilbert Blane in his observations on the Walcheren fever : in these instances, the fatal poison was inhaled in its most concentrated form ; when taken in a more diluted form its effects are less severe, as witnessed in the ague, which formerly prevailed in a very severe form in our fenny districts, but which is now become almost extinct by the superior and more effectual drainage employed. Now, although these effects are not so visible, or so immediately injurious to health in the badly-constructed courts, I cannot have any doubt in my mind but that it does produce an effect more or less injurious to health.

I remain, dear Sir,

Your obedient servant,

JAMES RUSSELL.

*R. A. Slaney, Esq.*



A STATISTICAL REPORT of a Survey, made with the view of ascertaining the state as to Level, Drainage, and Repair, of 202 Courts, situated in the Streets lying between Summer-row and Snow-hill, being a portion of the older part of Birmingham.

	Number of Courts visited in each Street.	Defective in proper Level, many with good Drains.	Insuffi- cient Drains, but many well Le- velled.	Effective both in Level and Drainage, but out of Repair.	In bad state of Repair.	Excellent both as regards Level, Drainage, and Repair.	Dis- graceful Courts.
Bread-street . . .	10	4	4	3	4	..	..
Newmarket-street .	1	1	1	..	1	..	..
Great Charles-street .	12	5	2	4	7	1	..
Edmund-street . . .	19	8	8	9	14	1	2
New Dale-street . . .	4	1	1	2	1	..	..
Mount-street . . .	8	4	3	3	4	..	..
Mary Ann-street . . .	6	2	5	1	4	..	..
Water-street . . .	8	5	5	2	6	..	..
Ludgate-hill . . .	7	5	4	..	6	..	2
Church-street . . .	9	5	4	6	7	..	..
Lionel-street . . .	24	12	14	9	22	1	2
Livery-street . . .	47	17	18	8	26	11	6
Henrietta-street . . .	10	6	6	2	6	2	..
Little Charles-street .	16	11	11	3	13	2	1
Ann-street . . .	4	1	2	2	4	..	1
Conegreve-street . . .	1	1	1	..	1	..	..
Fleet-street . . .	11	7	6	3	10	..	..
Charlotte-street . . .	5	1	2	2	3	1	1
Total . . .	202	96	97	59	139	19	15

The following Table exhibits the Ratio of Mortality to Population in the several Registrars' Districts in the Borough of Birmingham, in the years 1841 and 1842:—

Name of District.	Mortality per Cent. to Population.		Parish.
	1841.	1842.	
All Saints . . . . .	2.15	1.96	In parish of Birmingham.
St. George* . . . . .	2.62	2.56	Ditto.
St. Mary† . . . . .	2.69	2.39	Ditto.
St. Paul . . . . .	2.23	2.02	Ditto.
St. Philip . . . . .	2.4	2.49	Ditto.
St. Peter . . . . .	2.56	2.55	Ditto.
St. Martin . . . . .	2.61	2.3	Ditto.
St. Thomas . . . . .	2.17	2.66	Ditto.
Lady Wood . . . . .	1.82	2.1	Ditto.
Deritend and Bordesley .	2.13	2.15	Part of Aston parish.
Duddeston and Nechells .	2.5	2.42	Ditto.
Edgbaston . . . . .	1.51	1.43	Whole of parish of Edgbaston.
Borough of Birmingham	2.54	2.48	

\* The district of St. George includes the general hospital and the infant asylum, a branch of the Birmingham workhouse.

† The district of St. Mary includes the Birmingham workhouse.

*Observations on the preceding Statement.*

The above-mentioned establishments are *not* included in the statement of *mortality in districts*, as it would lead to erroneous conclusions as to the comparative salubrity of the districts, but the whole is included in the statement as to the borough of Birmingham. The low rate of mortality in the parish of Edgbaston is doubtless attributable to a generous supply of food and clothing amongst a comparatively wealthy class, as well as to locality.

The districts used for the purposes of registration of births and deaths, in Birmingham, are arbitrary divisions, originally formed for collection of poor-rates. They are not co-extensive with any parishes of the same names.

HENRY KNIGHT.

*Extract from a Letter, dated 29th December, 1843, from Thomas Weston, Esq., Mayor of Birmingham, addressed to the Secretary of the Health of Towns' Commission.*

“Although in this borough much has been done in the process of improvement, yet much still remains to be done; we have still many crowded, narrow, and inconvenient streets and passages, unfavourable alike to the health and convenience of the inhabitants; and, I believe, other large manufacturing boroughs must be in a similar situation.

“The greatest obstacle to improvement is the trouble and expense of obtaining a separate Act of Parliament for each occasion; but if an Act were passed enabling all town councils to effect improvements, and regulate newly-projected streets, under the sanction of Her Majesty's Secretary of State for the Home Department, or of a Board of Commissioners named for that purpose, I feel persuaded that the progressive improvement of towns would be much facilitated, and the general health of the inhabitants increased.”

### DEATHS in the Wolverhampton Union for the Three Years 1840-42.

Township.	1840	1841	1842	Average on Three Years.	1831 Popula- tion.	1841 Popula- tion.	Per Centage on 1841 Population.	Remarks.
Wolverhampton	1110	1006	1090	1068 $\frac{2}{3}$	24,710	36,382	2·9	The Union House being in Wolver- hampton increases the average of mortality against Wolverhampton.
Bilston . . .	652	613	620	628 $\frac{1}{3}$	14,492	20,180	3·1	
Willenhall . . .	189	229	250	222 $\frac{2}{3}$	5,834	8,695	2·5	
Wednesfield . .	70	70	108	82 $\frac{2}{3}$	1,879	3,168	2·6	
	2021	1918	2068	2002 $\frac{1}{3}$	46,915	68,425	2·8	

Sedgley in the borough of Wolverhampton, but within the Superintendent Registrar's district, the Dudley Union.



## CITY OF CHESTER.

POPULATION in the Year 1841, and Deaths for Three Years, ending June, 1843.

	Popu- lation, 1841.	Houses.		Number of Deaths for the Years ending			Total of Three Years.	Aver- age.
		In- habited.	Unia- habited.	June, 1841.	June, 1842.	June, 1843.		
CATHEDRAL DIVISION.								
St. Oswald's Parish . .	5,930	1,221	59	183	127	157	467	156
Precincts of Cathedral and Abbey Court . }	329	74	4	..	..	..	..	..
Parish of St. Peter . .	847	161	29	39	20	11	70	23
Parish of St. Bridget . .	675	140	23	23	15	17	55	18
Parish of St. Martin . .	459	103	6	15	14	11	40	13
Parish of Holy Trinity	2,960	592	43	84	75	64	223	74
	11,200	2,291	164	344	251	260	855	284
INSTITUTIONS.								
Collegiate College . .	25	..	..	..	..	..	..	..
City Gaol . . . .	59	..	..	4	..	1	5	2
Workhouse . . . .	298	..	..	69	53	54	176	59
Infirmary . . . .	73	..	..	49	52	26	127	42
	11,655	..	..	466	356	341	1,163	387
CASTLE DIVISION.								
Part of Great Bough- ton (exclusive of County, 198) . . }	751	160	29	28	23	16	67	22
Parish of St. John (including Spittal Boughton) . . }	6,929	1,465	94	219	198	156	573	191
Parish of St. Mary . .	2,975	647	87	94	101	76	271	90
Parish of St. Michael .	624	129	16	15	21	16	52	17
Parish of St. Olave . .	430	108	16	16	11	7	34	11
	11,709	2,509	242	372	354	271	997	331
INSTITUTIONS.								
Female Penitentiary .	14	..	..	..	..	..	..	..
Chester Castle . . .	436	..	..	10	3	16	29	10
	12,159	..	..	382	357	287	1,026	341
Totals { Cathedral Division }	11,655	..	..	466	356	341	1,163	..
	12,159	..	..	382	357	287	1,026	..
	23,814	..	..	848	713	628	2,189	729*

October 4, 1843.

THOMAS PARRY,  
Superintendent Registrar.

\* This annual mortality exceeds 3 per cent. on the population, showing a very high rate, and pressing heavily on the working and poorer classes.—R. A. S.

## GLOUCESTER.

RETURN of the Number of Deaths Registered within the Borough of Gloucester\* during the Years 1840, 1841, 1842, and to 1st December, 1843, showing the Number of such Deaths that have occurred during those periods of Consumption, Epidemic, Endemic, and Contagious Diseases, and from other Causes, with the Annual Ratio per Cent. of Mortality on the Population, according to the Census of 1841.

Year.	Number of Deaths.				
	Under Five Years of Age.	Total Number of Deaths.	By Consumption.	By Epidemic, Endemic, and Contagious Diseases.	Deaths from other Causes.
1840 . . . . .	190	447	82	171	194
1841 . . . . .	190	393	57	131	205
1842 . . . . .	173	430	87	135	208
1843 (to 1st December) .	135	351	63	99	189
Totals . . . . .	688	1,621	289	536	796
Average Annual Mortality, &c., in three years and eleven months . .	175·65	413·87	73·78	136·85	128·25

Year.	Population.		Ratio of Mortality.			
	In 1831.	In 1841.	By Consumption.	By Epidemic, &c. Diseases.	From other Causes.	Total.
1840 . . . . .	13,686	14,869	0·55	1·15	1·31	3·01
1841 . . . . .			0·38	0·88	1·37	2·63
1842 . . . . .			0·58	0·91	1·39	2·88†
1843 (to 1st December) .			0·45	0·72	1·37	2·54
Average Annual Mortality, &c., in three years and eleven months . .	..	..	0·49	0·92	1·37	2·76

\* Comprising the parishes or places of St. Aldate, St. Catherine, St. John Baptist, St. Mary-de-Crypt, St. Mary-de-Grace, St. Mary-de-Lode, St. Michael, St. Nicholas, St. Owen, Holy Trinity, Littleworth, and so much of the hamlets of Barton St. Michael, Barton St. Mary, and South Hamlet as lie within the Parliamentary bounds of the borough of Gloucester.

† Exceeding 2·8 per cent. on the population on average of three years.—R. A. S. Gloucester, December 7, 1843.

MY DEAR SIR,

Gloucester, November 23, 1843.

IN compliance with your request, I beg to state briefly the result of my observations on the sanatory condition of Gloucester.

I would premise, that the surest method of testing this condition would be to ascertain the rate of mortality, and the proportion of sickness, whether epidemic, endemic, or casual, occurring in the several districts and parts of the city. The duration of life, with reference to *locality* and *occupation*, might be learnt from an examination of the books of the *district registrars*. The amount of sickness, however, could not be determined with any exactness, partly because the statistics of our medical charities are very defective,



and partly because a vast amount of disease among the poor does not come at all under medical observation or treatment.

Not being, therefore, prepared at present with this class of facts, in demonstration of our case, I will merely allude to the main causes of the *admitted* unhealthiness of the population.

1st. The defect of sewerage. There are, in this place, *no* common sewers. True, there are sewers belonging to two or three public buildings, and I will not assert that some private houses may not have taken advantage of these sewers, as others have of the old water-courses which permeate the city. But there is no *general* sewerage, and none at all in the worst part of the city. Yet Gloucester presents remarkable facilities for this most essential improvement. Elevated in the centre, the ground falls by an easy declivity on one side towards the Severn, and in other directions towards brooks and water-courses running into the Severn. Many of these water-courses, and all the ditches in the suburbs, are in the most horrible state imaginable. Filled with black, stagnant, half fluid, half solid, contents, open to the eyes and noses of passengers, and constantly emitting miasmatic exhalations. I could point out ditches of this kind all round Gloucester. A traveller approaching this city in the summer might detect it by its offensive smell, for some distance before entering its streets.

2nd. As a necessary result of the want of public drains, few even of the best houses contain water-closets; where there are any water-closets, either deep pits or cesspools have been sunk at the back of the houses, or communications have been opened with some of the open ditches or covered streams in the neighbourhood. The houses of the tradespeople, even in the principal streets, are frequently without privies. Many, to my knowledge, have only tubs covered with seats, and *kept in the cellars!* These tubs are carried out and emptied by night into the Severn, or an adjacent brook, as often as is thought necessary. The effect of such a nuisance in the house on the health of the inmates, I need not add, is most deleterious; and the practice of carrying about the contents of these tubs, privies, and cesspools by night, contaminates the atmosphere of the whole city.

3rd. The dwellings of the poor necessarily suffer the most from this state of things. The closeness and filth of most of the alleys, lanes, and courts, baffle description; I would name especially those in the Island, Quay-street, Leather-bottle-lane, and the more modern streets and alleys in the neighbourhood of *Sweet-briar-street*, so called I suppose from one of the deepest, darkest, and most fetid open ditches in the city, which runs through half the extent of this street.

Most of the drains in these places are on the surface. In several courts there is only one privy common to all the inhabitants. I am told that in emptying *one* large pit belonging to a court in Quay-street, soon after the cholera, *three* labourers lost their lives from the pestilential vapour.

The courts are for the most part closed at the farther extremity, and their openings into the street are small and not readily detected. Removed from observation, having no thoroughfare, without a possibility of ventilation, and frequently without a pump or any supply of fresh water, these courts contain, as in other towns, the dirtiest and most immoral characters. They are also, as might be expected, the foci of disease. The ravages of the cholera were almost confined to the localities I have named. At present struma in all its forms, diarrhœa, dysentery, and fever, are the prevailing diseases. An unusual number of children die of marasmus from mesenteric disease.

4th. An extensive district called *New Town*, in an open and airy part of the suburbs, consists chiefly of small wooden or mud cottages, built on the stiff blue clay of the Severn valley, with one or two small rooms, all *on the ground floor*, and, as elsewhere, without drainage. These miserable huts are of course both cold and damp. Ophthalmia and intermittent fever are very prevalent here.

5th. The lodging-houses, especially in Leather-bottle-lane, are as bad as in any town which has undergone a statistical investigation. It requires strong nerves and a strong stomach to examine them. I have seen a small room, in which 14 men, women, and children are allowed to lie at night, allowing only about 100 cubic feet to each inmate!

6th. Many of the smaller new streets are unpaved, unlighted, and impassable by carriages. The space between the houses is occupied with heaps of refuse and pools of muddy water. I can at once call to mind eight or nine streets in this condition. In these streets, as in closed courts, the inhabitants are invariably in a degraded condition, morally and physically.

The paving throughout Gloucester is bad. The gutters and surface-drains in all the more ancient and narrow streets are very imperfect, and the passenger is constantly liable to step into one of the small half-concealed collections of stagnant water which infest his path.

7th. The state of the grave-yards of this city is very deplorable. *Two* have recently been closed from the absolute impossibility of cramming any more corpses into them. One of these (St. Michael's) has been raised, by the accumulated remains of centuries, to a level of six feet above the floor of the church! I could mention several facts relative to the burial-grounds of St. John's, St. Mary de Crypt, and St. Mary de Lode, which show the necessity of putting a stop to *intra-mural* sepulture, except in existing *vaults*.

I beg to remain, dear Sir, respectfully and faithfully yours,

H. W. RUMSEY

W. H. Hyett, Esq.



# REPORT

ON THE

STATE OF BRISTOL, BATH, FROME, SWANSEA,  
MERTHYR TYDFIL, AND BRECON.

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BY SIR HENRY T. DE LA BECHE,

ONE OF THE COMMISSIONERS APPOINTED BY HER MAJESTY FOR INQUIRING INTO THE  
STATE OF LARGE TOWNS AND POPULOUS DISTRICTS IN ENGLAND AND WALES.

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e, and the



# REFERENCE

- 1 Deery Chapel
- 2 Trinity Church, Botwell
- 3 Clifton Church
- 4 The Cathedral
- 5 St. Augustine's Church
- 6 Mayer's Chapel
- 7 St. Augustine's Chapel
- 8 St. Michael's Church
- 9 St. James' Church
- 10 Magdalen Chapel
- 11 St. Paul's Church
- 12 Christ Church
- 13 St. John's Church
- 14 St. Werburgh's Church
- 15 St. Stephen's Church
- 16 St. Nicholas Church
- 17 All Saints Church
- 18 St. Maryport Church
- 19 St. Peter's Church
- 20 Trinity Church, St. Philips
- 21 St. Philips Church
- 22 Temple Church
- 23 St. Thomas' Church
- 24 Redcliff Church
- 25 St. Paul's, Westminster
- 26 Westminster Church





REPORT *on the* SANATORY CONDITION of BRISTOL.

BY SIR H. T. DE LA BECHE, AND DR. LYON PLAYFAIR.

*Situation.*—Comprising Clifton, the Hotwells, Bedminster, and other suburbs, under the general head of this city, Bristol stands on ground of very variable elevation and form. From Clifton, on the west, where St. Vincent's rocks and other cliffs rise above the Avon, land of 200 or 250 feet in height ranges eastward to Kingsdown, presenting, as a whole, a somewhat tabular character. Clifton is chiefly situated on this table land, upon which also stand Berkeley-square and other buildings at the head of Park-street. At present Tyndal's Park separates this portion of the town from that which may be included under the general name of Kingsdown, but it is reported that buildings will shortly be erected on this open space.

A somewhat sharp slope descends from the high ground to the southward, and upon this a large portion of the city is built, comprising a chief part of the Hotwells, and the lower parts of Clifton, Park-street, and the streets adjacent, with a large mass of buildings situate between the ground bordering the Frome river, and extending thence by the Horse Fair, to the southward of Stokes Croft.

A minor elevation keeps the line of Clare, Corn, and Wine streets, and proceeds thence by Narrow Wine-street, and St. Peter's-street to Castle, Old Market, and West streets. From this minor rise of land, the ground descends on one side to the Frome, and, on the other, to the old course of the Avon, now occupied by the floating harbour. Another minor elevation occurs at Redcliff, supporting Redcliff church, and includes Redcliff-hill with many adjacent streets, lanes, and courts.

The remainder of the town, comprising some parts of the Hotwells, a district around College-green, (itself on a slight elevation,) Queen's-square, the course of the Frome, a large block of buildings of the Temple district, with others in St. Philip's and St. Paul's, and a portion of Bedminster, is on low, and, for the most part, flat grounds.

That portion of the Avon, a tidal river, which once divided Bristol into two unequal parts, was converted into a floating harbour, and a new cut was made for the passage of the river waters; the lower part of the Frome, one enlarged for the purposes of commerce at a former period, being included in this floating harbour. The waters of the Frome are conducted by means of a culvert under a long line of quay, and under the floating harbour, near Princes-street bridge to the new cut, near the gaol.

The country to the southward of Bristol is formed of minor hills and undulating ground, rising gradually towards Dundry-hill, about 700 feet above the sea. The elevated land, upon which Clifton and the higher parts of Bristol are built, ranges westward to the Bristol Channel, at Clifden, the Avon flowing through the Clifton gorge, and cutting off the town in that direction.

Including Clifton, a large part of this city is on elevated land, or on a

slope having a southern aspect, with a fair proportion on minor elevations, while an area of less extent than might at first be supposed is flat and low.

*Climate.*—This, which necessarily has so much influence upon the structure of buildings for protection from it, requiring more or less provision against damp and cold, and often, according to its character, more or less aiding the injurious effects of stagnant filth, open drains, and the like, is very variable. Tables, showing the temperature of Bristol, have been carefully kept at the Institution in Park-street, from 1827 to 1842 inclusive, (16 years,) and of the fall of rain, and of the number of rainy days for the same period.

A knowledge of the annual mean temperature only, 53° Fahrenheit, at Bristol, conveys but a faint idea of the variations of temperature at this place, where we find a range from a mean temperature for January, from 32° in one year (1838) to 47° in another (1834). As a whole, the climate cannot be termed cold, in comparison with many others in Great Britain, as the means for the following months, for the 16 years above named, will show.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
39°·2	41°·6	45°·4	56°·8	59°·4	65°·0	66°·8	65°·6	60°·0	53°·0	46°·0	43°·4

The fall of rain is also very variable, even the mean annual quantity for the year differing from 29·54 inches (in 1832) to 37·91 (in 1838). Yet taking the average mean at about 32·92 inches, it is evident that with care a great quantity of soft water may be tanked for domestic purposes; a mode of storing soft water too much neglected in Great Britain, where so much might be thus rendered available.

In many parts of Bristol, the tanking, or otherwise storing of rain water is not neglected, so that, to a certain extent, the rain water is turned to account. From the tables at the Institution it appears that the fall of rain is distributed over many days in the year, varying in the 16 years from 141 to 184, the annual mean for that time being 161 days, or about four-ninths of the year. Including fogs and mists, rainy weather prevails for more than half the year, and the climate, as might be expected from its geographical position, is often damp at other times, so that the climate of Bristol may in general terms be characterised as mild and somewhat damp. The mildness of the climate is necessarily of great importance to the poor man, saving him that expenditure in clothing and fuel which the dampness may not require to be provided; but it will be evident that, in close ill-ventilated localities, such as many courts and lanes are, this kind of climate is one requiring well-ventilated houses and streets, with great attention to drainage, and the careful provision against slow moving open sewers and stagnant waters impregnated with filth. The prevalent winds are from the west and south-west. These sweep through Clifton and the higher parts of Bristol freely; as, indeed, from the position of these localities do most other winds. From the arrangements of the streets in



Scale — 3 1/2 inches to one mile

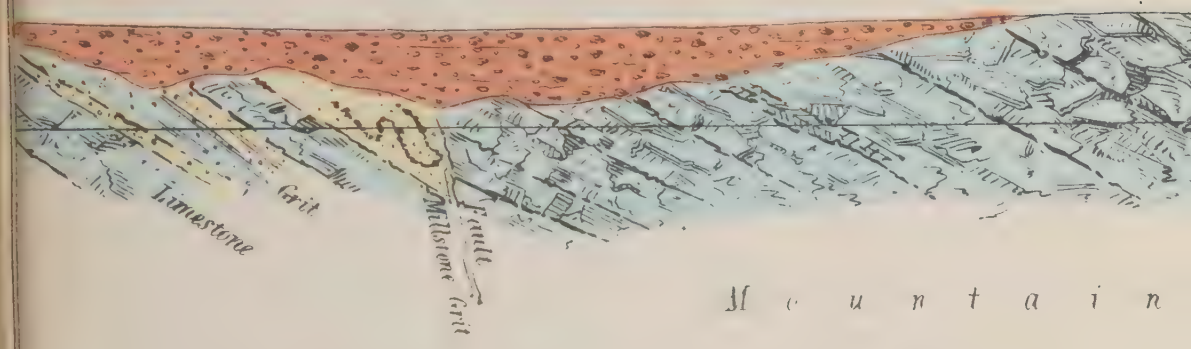
or 1 inch to 180 yards

or 1 to 6480

(same as Ashmeads small Map of Bristol)

# M a g n e s i a n   C o n g l o m e r a t e

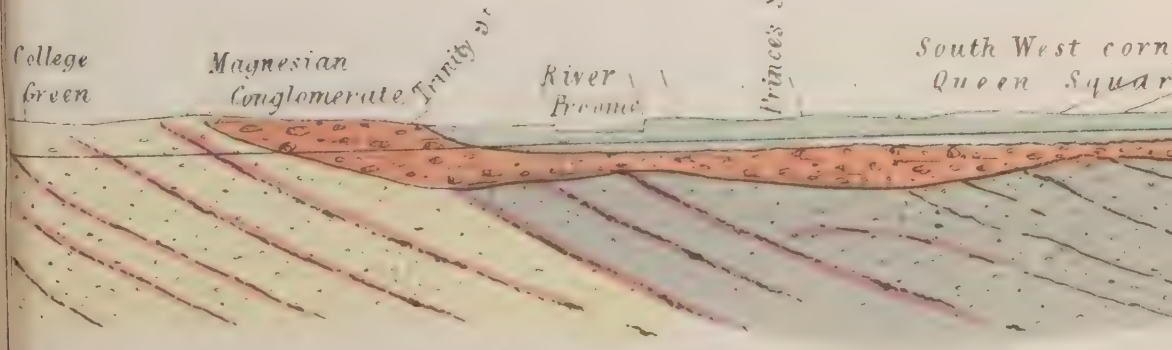
Path



M o u n t a i n

300

A l l u v i



College Green

Magnesian Conglomerate

Trinity St

River Frome

Princes St

South West corner Queen Square

C o a l   M e a s

2500





the lower parts of the city, that portion of it has not equal advantages ; so that in this respect, independently of differences in exposure to the sun and of temperature from different heights, Bristol and its suburbs vary materially. The temperature recorded at the Park-street Institution would chiefly correspond with that of the lower portions of the town, and be higher than that experienced at Clifton, and in the more elevated localities of the city.

Though there are gas and some other works evolving noxious vapours, or much smoke, on the western parts of the town, the bulk of these is to the eastward ; so that, regarded as a whole, Bristol may be considered as rather fortunate in the position of those manufactories which eject noisome vapours and great volumes of smoke into the air, the chief part of them being thus on the leeward part of the town, and the vapours and smoke carried away from it.

*Geological character of the ground on which the city and suburbs are built.*—Mr. William Sanders, F.G.S., being so intimately acquainted with the geology of the district, having indeed completed a very detailed and accurate map of it for the Ordnance Geological Survey of Great Britain, he was requested to supply us with an account of so much of the geology of Bristol as might be useful to the Health of Towns Commission, the character of surface, more especially as regards dryness, or damp, and wet, and the nature and supply of the spring waters being so intimately connected with the kind of rocks occurring beneath.\*

By reference to the accompanying map of Bristol it will be seen that Mr. Sanders has traced upon it the boundaries of the various rocks as they come to the surface ; thus showing at a glance the geological character of the ground in the different parts of the town and suburbs. The mode in which these rocks occur beneath, relatively to each other, will be seen by the accompanying section, one taken in a line crossing Clifton and Bristol, from Durdham Down, (near the Clifton turnpike,) by Richmond-terrace, Berkeley-place, Brandon-hill, Great George-street, College-street, College-green, Trinity-street, Princes-street, Queen's-square, Redcliff-hill, Somerset-street, and the new cut to Pyle-hill.

The following is a brief account of the rocks upon which Bristol and its suburbs stand :—

*Mountain, or Carboniferous Limestone.*—Composed of numerous compact marble limestone beds, from a few inches to several feet thick, with some occasional shales, the upper portion containing grits or hard sand-stones.

This rock is traversed by so many fissures, and the dip of the beds is so considerable, (as will be seen by reference to the section,) that the water falling on its surface readily finds a passage through and amid the beds, and is discharged at or near the sea level, along lines of the chief fissures, or of the fractures, technically termed faults, in the shape of copious springs.

The intermixture of hard sandstones or grits, shales, and limestones, in the upper part of this rock, is favourable to the retention of water

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\* The term *rock* is to be here understood in its geological sense, and therefore as including beds of sands, clays, and gravels, as well as the hard mineral substances usually so called.

among the beds in some places, more particularly where the shale prevails; and it may be then obtained by wells.

*Millstone Grit.*—This name is given to a series, about 1000 feet thick, of sandstones or grits, chiefly hard, mingled with some beds of clay, found principally in the middle of the group, but more or less dispersed through it.

From the arrangement of the beds and their composition, water is retained among them, and sometimes thrown out as springs, as at *Jacob's Well*.

*Coal Measures.*—These consist of beds of sandstones, shales, and clays, interstratified more or less with seams and beds of coal. From their mode of occurrence, these beds also hold water among them.

To these rocks, which, by reference to the section, will be observed to be tilted up at a considerable angle, succeed others which rest more or less horizontally upon them. The lowest of these is a mass of rolled or angular fragments of the subjacent rocks, cemented by a magnesian-calcareous cement, the whole known as *Magnesian Conglomerate and Limestone*. The map shows the areas occupied by this rock, a fair section of which is to be seen rising above the float, near St. Augustine's Church. The rain water easily percolates through these beds to those beneath, or is retained in minor cavities in them.

Red sandstones and marls, forming a part of the *New Red Sandstone Series*, as it is termed, occur in the ascending order of succession above the magnesian limestones and conglomerates, and indeed are much intermingled with them.

Hard rough sandstones prevail in the lower part of this series, as developed at Bristol, supporting softer red sandstones, which form the rock upon which a considerable portion of the city is built. Red marls prevail in the upper part of this series, but little of the town seems built upon them. The interstratification of the marls or clays and sandstones, is highly favourable to the retention of water in these rocks, and accordingly it is abundantly obtained from them. The *lias*, a mixture of thin-bedded limestone and marls, constitutes so small a portion of the area under consideration that it may be neglected.

More modern drifted clays, sands, and gravels, chiefly known as *alluvium*, follow the course of the Frome and Avon, forming low grounds. Mr. Sanders ascertained, from wells or borings, that the alluvial drifts in Temple parish and Queen's-square consisted, in the descending order, of from 25 to 30 feet of dark-blue or gray clay, locally containing thin beds of peat; and that beneath this clay, sand, silt, and gravel, the latter occupying the lowest part, from 5 to 10 feet thick, were found.

The whole of the alluvial beds appear to be saturated with water. Wells, in the clay, interfere but slightly with each other, as there is not a free communication for water between distant parts in this substance; but the beds beneath (sands and gravels) are so porous, that the water in them may be regarded as forming one large sheet easily flowing among these sands and gravels.

Looking at the mode of occurrence and the character of these various rocks, and at the form of the surface ground, the chief part of Bristol may be regarded as naturally dry. The low alluvial grounds following the courses of the Frome and Avon are the principal exceptions.



Neither the nature of the rocks nor the character of the surface offers obstacles to an effectual drainage of the town and suburbs, more particularly as a considerable rise and fall of tide would prevent even the low flats from the accumulation of sewage. The greater part of the town may be regarded as extremely well situated for drainage.

*Floods.*—Although at extraordinary high spring-tides the waters of the Avon, when in flood, become checked beyond the new cut, and thus spread over the lower lands, this chiefly happens to those localities which are above the town, in the direction of St. Philip's Marsh, and the check being removed at the ebb, the waters, ponded back by the tide, are released. Thus such floods cannot long remain, and the check to their discharge is only temporary.

The discharge of the Frome in flood is not so easy, flowing as it does through alluvial lands at a somewhat higher level, until near the Floating-harbour. Passing into the town, its waters, in flood, meet with much obstruction, though there is an ingenious arrangement of gates to allow of such surplus waters of the Frome as cannot pass through a culvert into the new cut, to be discharged into the float. The consequence is, that the lowest grounds near the course of the Frome suffer from floods; obstructions to the discharge of which are presented in the town itself.

*Sewerage and Cleansing.*—The paving, cleansing, and lighting of the city and liberties of Bristol are, by an Act passed in 1806, vested in the mayor and aldermen, who by warrants directed to the churchwardens of the several parishes, and to the guardians of the poor of the Castle Precincts, require such churchwardens and guardians to assemble the householders, rated to the church and poor, within their respective parishes, the householders to elect 10 persons in the respective parishes, (having either 40*l.* per annum real estate in the city and liberties, or 1000*l.* personal estate,) out of whom the mayor and aldermen select two for each parish and the Castle Precincts, who shall be the Commissioners for paving, cleansing, and lighting, for two years after their appointment.

The churchwardens, neglecting or omitting to return lists of householders, the mayor and aldermen in General Quarter Sessions nominate and appoint at their discretion such householders within the parishes and Castle Precincts as may be duly qualified.

The Commissioners going out of office at the expiration of the time for which they are appointed are re-eligible, but not compellable, to serve for two appointments in succession: should they refuse to take the appointment upon them when first elected, [they not only pay a penalty of 20*l.*, but are also liable to be again nominated and elected at the next ensuing appointment of Commissioners.

The Commissioners appoint a treasurer and such other officers as they may consider necessary, whose salaries are sanctioned by the justices of the city and county, and who are not allowed to receive fees.

The Commissioners possess the power to construct and alter such sewers and drains as they may think proper, excepting those which the Directors of the Bristol Dock Company have authority, under the Act of the 43rd of George III., to form and alter; but they have no power to compel the owners of houses to drain into them. Persons wishing to deliver drains from their houses into the public sewers must do so at their own cost, and the drains must be constructed under the

direction of the Commissioners or their agent. Any person making private drains into the public sewers, without the knowledge or contrary to the directions of the Commissioners or their agent, forfeits 20*l.* over and besides the expenses of altering and removing any such private drain, according to the direction of the Commissioners or their agent. Alterations or repairs of private drains are under the direction of the Commissioners, and made at the cost of the owners or occupiers of the lands or houses.

For raising money to carry out the objects for which the Commissioners are appointed, they certify yearly the sum that may be necessary to the justices in sessions, who are empowered to order and appoint such sum to be raised on all land, houses, &c., within the city. The mayor and aldermen proportion out the sum required upon each parish and the Castle Precincts, according as the money is raised for the maintenance of the poor. The churchwardens and overseers of the poor of the Castle Precincts assess and collect the rates, and receive threepence in the pound on the money assessed and paid.

The accounts of the Commissioners are audited annually by the justices, who, if they think fit, may order the publication of them in two or more of the Bristol newspapers.

The rates are paid by the tenants or the occupiers of premises, and a moiety of such rates are allowed them by their landlords, unless special agreements are made between landlord and tenants to the contrary. In case of any disputes between out-going and in-coming tenants respecting the proportion of rates to be paid, two justices of the city and county of Bristol are authorized to apportion the rates between them.

By an Act of the 3rd of George IV., the Commissioners were empowered to repeal the then existing rules and bye-laws, and to make and pass others. A Committee of Inspection is appointed, and consists of nine Commissioners, five of whom retire every six months, and are replaced by five others. No Commissioner on this Committee is allowed to view and report upon any defect, reparation, or alteration in any place wherein he may be personally interested.

The surveyor is ordered to keep a daily journal of the works he inspects, to be produced before the Committee of Inspection and the General Board. With regard to sewers, whenever any sewer is open for cleansing or repairs, he is directed to enter in a book, called the *Sewer Book*, a particular description of each sewer, stating all particulars respecting it, so as to afford an accurate account of it; and during the progress of any such work, to examine the maps of sewers, and correct them where necessary, every new sewer being laid down by him on the maps.

Among the duties of the "inspector," he is required to visit the several districts on the days appointed for the scavengers' attendance therein, and to see that the streets, lanes, &c. are properly swept, and the soil and the ashes of the inhabitants be taken away in due time. He also is directed to keep a daily journal, to be exhibited to the Committee of Inspection, and to attend at least once in every day at the Office of the Commissioners, to enter in his daily journal any complaints which may have been made.

There is no public survey of the town comprehending a system of levels from a common datum for the regulation of the drainage or other



structural arrangements. The accompanying sketch of the arrangement of the sewers of Bristol, laid down upon the large six-sheet map of Ashmead, would appear to be the first ever attempted. For this we are indebted to Mr. William Sanders, aided by the information of Mr. Armstrong, the surveyor to the Commissioners of Paving and Cleansing, who in the most handsome manner directed their surveyor, and other officers, to afford us every information in their power.

Partial maps exist, and the general situations of the sewers are known ; but it will be only by degrees that the surveyor can become acquainted with them in proper detail, as the work of repair and examination can be carried out.

The order for the "Sewer Book," is dated 24th January, 1841, and it does not appear that other than very incomplete records of the sewers were previously kept. The present sewerage being the result of works carried on for several centuries, without regard to any fixed system, except that of getting the sewers into the old courses of the Frome and Avon, in the way considered most convenient for the time being, the present drainage is in little accordance with any general and effective system which might now be devised for the town ; and supposing such a system to be agreed upon by the Commissioners, it would require both much time and expense to have it properly carried out.

It is but justice to the Commissioners to state that they evince every desire to get the general sewerage of the city into an effective state, and that their surveyor, Mr. Armstrong, is an efficient officer ; but the complication of the old sewers, the interruption to the free discharge of many sewers by the Floating-harbour, and, as it is understood, the absence of the proper amount of funds for any operations on an extended scale, considerably cripple their exertions.

The whole of the sewerage, anterior to the construction of the Floating-harbour, in 1809, was arranged for delivery into a tidal river, so that when the new cut was made (see map) from the Hotwells to St. Philip's Marsh, for the passage of the Avon, and the old course of the river between these points was converted into a Floating-harbour, nearly the whole sewerage of the city, as regarded its delivery into the tidal river, was disorganized, and the sewage thrown into the stagnant waters of the Floating-harbour.

It would appear that, after the damming up of the old channels of the Avon and Frome in 1809, disagreeable smells were emitted from the stagnant waters during warm weather, which were considered to engender disease ; frequent applications were made to the Dock Company and other public bodies to remedy the evil, and many plans and suggestions were offered, but the Directors refused to move in the matter, stating that the execution of such plans was not within their line of duty, and that they possessed no powers for the purpose by the Act of 1803, under which the float, &c. had been formed. During the hot summer of 1825 the float became so offensive that the inhabitants complained loudly ; there was much controversy, and eventually the Commissioners of Sewers took up the subject, and considered that, under the 37th section of the Dock Act, the Directors were required, at the charge of the Company, to alter and amend the sewers of the city, as might be necessary from the change of conditions produced by the floating harbour.

The Directors resisted this interpretation of the Act, stating that they had completed a sewer at Castle Pill, through Bread and Avon streets, into the Avon, above the dam at Temple Meads, the only sewer they were compelled to make.

In consequence, in 1826, the Commissioners of Sewers applied for a writ of mandamus requiring the Dock Company to construct the necessary works. The case was argued in the Court of King's Bench, and the writ, after much litigation, obtained in 1827. There were affidavits made in this matter by some of the chief medical men of the city to the effect that the effluvia was not unwholesome.

In consequence of the mandamus, the sewage falling into the Frome, above the Stone Bridge, now passes through a culvert carrying off the Frome waters, with the filth discharged into it above the bridge, by Broad Quay and beneath the Floating-harbour at Prince's-street Bridge, to the new cut near the gaol. A small amount of sewage is also taken up at the Docks near the Butts, and is carried beneath the float, a large sewer not far distant being permitted to deliver itself into the float. These and the sewer crossing near Marsh Bridge constitute all that has been yet done.

A mass of sewage is still discharged into the waters of the Floating-harbour. The chief part of the crowded districts of Temple and Redcliff districts so drain. The map shows the mouths of 16 sewers of those districts, some of them large, thus emptying themselves, independently of the filth thrown into the float from the houses which immediately adjoin it. On the opposite side of the float, 18 sewers, of which some are large, thus deliver themselves; and seven more empty themselves into it between the Butts and the Stone Bridge at the head of the Frome branch of the float, two of which are large, one draining the district between the Butts and College-street and places adjacent, and the other the district between Hanover-street and Berkley-square, including Frogmore and Park streets.

Some of these sewers get so full of filth at their mouths that when the float waters are let out it is necessary to cut and rake away the accumulations. A bank of filth, a yard high, is found in the main sewer between Bath-street and the float, when the waters of the latter are let out. All the ends of the sewers intended to deliver their contents into the old tidal river, at levels beneath that at which the float waters are usually kept, are necessarily ponded back to that level; yet much of the filth, by its pressure, seems to slip into the bed of the float, judging from the gaseous emanations passing through the water, which are observable at the mouths of many of the sewers, particularly in warm weather.

It is stated that the sewer which drains Park-street and others in that direction is so checked by the float waters that, when it discharges itself into them, it is ponded back for 40 yards; and that when, during storms, a body of water finds its way into this sewer, it has burst into the cellars of Hanson-street.

The course of the Frome, after that river enters among the houses of the town, may be regarded as the chief sewage nuisance in Bristol. Into it is discharged a large mass of the filth of the town, and it may be considered as a great open sewer until it reaches the Stone Bridge, where it enters the culvert above mentioned—a very ingenious contriv-



ance of flood-gates, allowing the surplus waters in floods to escape into the adjoining branch of the Floating-harbour, while the pressure of the waters in the latter, at other times, keeps them closed, and the Frome, with its charge of sewage, passes into the culvert.

When the waters of the Frome are low, as generally happens in summer and autumn, the stench from the course of the Frome is great, and the inhabitants of the houses adjoining it, mostly of the poorer class, as scarcely any others will live in them, describe it as at times making them turn sick, and to be such as to compel them, as much as possible, to close their windows and doors against it.

It has been proposed to arch over this part of the Frome, and thus to convert it into a main sewer; the space above to be formed into a good street, the present wretched courts and other tenements adjoining it being removed. A part of it has been arched over for the new bride-well; and it is to be hoped that so very obvious an improvement for the health of the town may not be neglected.

It is but justice to the surveyor of sewers, Mr. Armstrong, to state that he has proposed to remedy much of the mischief produced by the float, by reversing that part (the chief part) of the drainage of the Temple and Redcliff districts which is now discharged into the float, and by carrying it, by means of a tunnel, beneath Redcliff-hill into the new cut. This, if properly carried out, would be a most important step, and relieve a populous part of the town, abounding in miserable localities, from much wretchedness. The rock of which Redcliff-hill is formed (red sandstone) could be readily excavated, and a fair reversed fall obtained for the whole area to be benefited.

With respect to the form of sewers, as these have been constructed at such different times, without reference to any system, much variety is to be expected, and is found. The forms of sewers used by Mr. Armstrong are either oval or circular, and appear to be well adapted to the situations in which they are placed. When he can obtain it, he prefers a fall of 1 inch in 5 feet; and he states that, in some parts of the town, he can only get 1 inch in 30 feet. He prefers that the collateral should empty themselves into the main sewers at from 6 to 12 inches above the bottom of the latter, with a slope, at the actual junction, to the bottom. He approves of flushing, though he has not hitherto employed it; but intends to do so when possible and desirable. Mr. Armstrong states that much more mischief than might at first sight be supposed is caused by the rats in old sewers, boring through them and letting out their contents in various directions. He suggests that whenever a new street is made, the Commissioners should have power to construct a main sewer in it, and to compel each house to form a proper and effective drain into the main sewer according to the surveyor's plan.

*Scavengering.*—The city, or that portion of it which is under the control of the Commissioners of Paving and Cleansing, is, as regards scavengering, divided into six districts, for each of which there is a separate contractor, who engages to clean the streets and take away ashes, dust, &c. twice in each week.

In the city, it would appear that the scavengers are not bound to clean the foot pavements; and therefore, the courts being considered as foot pavements, the scavengers do not enter them. When the in-

habitants of these courts desire to remove the refuse and ashes which accumulate in them, they must convey such refuse in boxes, baskets, or by other means to the adjoining streets, there to be removed by the scavengers. In consequence of this want of attention to the courts, they are often, more especially in the poorer districts, in a filthy state, while the streets may be described as generally well cleansed.

In the houses of the more easy classes there is a fair provision for the reception of ashes, to be taken to the scavengers' carts when they go their rounds, but in the poorer houses ash-bins are much neglected.

There would appear to be no fixed places for the deposit of the town refuse, the scavenger contractors discharging their carts wherever they may be permitted and it may be found most convenient for the time. The screened ashes are usually sold to the masons, and the remainder of the refuse is, for the most part, employed for horticultural and agricultural purposes. The general value of the town refuse is unknown, each contractor selling to the best advantage and not furnishing any accounts.

Unfortunately, the power of the Commissioners only extending to the ancient limits of the city and its liberties, and there being apparently little or nothing beyond the ordinary parish arrangements in force in the out-parishes and suburbs, the sewerage and cleansing of these out-parishes and suburbs are much neglected, and often very defective, especially in localities inhabited by the poor. In Clifton, though chiefly composed of handsome houses, inhabited by persons in affluent and easy circumstances, the want of proper sewerage is deplorable. Ranges of handsome houses, otherwise well appointed, have nothing but a system of cesspools—often the holes from which the stones for building the chief and rough parts of the houses have been taken. There is indeed a sewer down two-thirds of the Royal Crescent, with one from Caledonia-place, falling into another from Sion-hill, which seems also to drain a part of Prince's-buildings in its passage over the cliffs to the river. A sewer comes down from Saville-place and houses adjacent; and in the direction of Richmond-terrace there is some drainage, passing down by Berkeley-place and Woodwell-lane to the float; but the mass of houses in Clifton has no sewerage.

In the out-parish of St. James many of the sewers seem to communicate with the city sewerage; much of the sewage of the out-parish of St. Paul seems to find its way into the water-course which joins the Frome at Baptist Mills, one which is noticed as offensive in warm weather. A large portion of the sewerage in the out-parish of St. Philip and Jacob is in a miserable state: there is one district, termed the Dings, in which it is wretched. It is also very bad in many parts of Bedminster.

In the higher parts, and other situations, in Clifton, where the good houses prevail, the cleansing, as might be expected, is good; but in the poorer situations, and in the Bristol out-parishes and suburbs, it is very indifferent, and accumulations of filth, which should never be permitted, are to be found, more especially among the poorer inhabitants.

There can be little doubt that if the powers of the Commissioners of Sewers for the city were extended over the out-parishes and suburbs, a far better state of sewerage and cleansing would arise than that which now exists.



*State of the Town as regards Streets, Alleys, and Courts.*—As might be anticipated in an ancient city like Bristol, the old parts of it are ill-constructed as regards width of streets and their ventilation. The older streets are, for the most part, narrow; the lanes and alleys frequent, and the courts numerous and confined. As it becomes necessary to take down old houses, those with stories gradually approaching as they rose above each other, until there was little distance between the higher parts of the houses on each side of streets, once frequent in Bristol, are gradually becoming rare, and there seems a general disposition to improve the chief old streets as opportunities arise.

Still, however, narrow streets and lanes are not uncommon in the older parts of the town, and there is a large proportion of narrow alleys and confined courts in many localities.

In the large mass of buildings in the Temple district, Temple-street, though generally composed of indifferent houses, is the best from its greater width; but leading out of it, in various directions, are numerous miserable courts, ill-ventilated. The same district also contains many wretched courts and alleys. A part of the Redcliff district is in the same condition; but improvements are being made near the church, which will tend greatly to ventilate a portion of it.

There are some wretched tenements in the neighbourhood of Lewin's Mead, and along the course of the Frome, in the direction of the Pithay; the streets and courts containing them are ill-constructed with regard to proper ventilation.

There are some wretched habitations in the district of St. Philip, though the streets are better laid out than in the more central and ancient parts of the city, as is also the case with the district comprising Poyntz, or Bull Paunch Pool, New-street, Wade-street, &c. Between these last-mentioned localities there is a broad line of good ventilation in an east and west direction, forming West-street, and Old Market-street, which is continued, though narrower, into Castle-street.

The mass of buildings which rise and cover a part of the hill, in the direction of King's Down, being exposed to the prevalent winds, may be considered to be well situated as regards a free circulation of air. Clifton, from its high and dry situation, and the wide distribution of its good-classed houses, is most excellently placed. The lower part, or Hotwells, contains some ill-constructed lanes; but as a whole even this portion is fairly exposed to the winds, and the fault more in the houses than in the position of the streets.

The chief open places in Bristol are Queen's and St. James's Squares, College-green, and the open space near St. James's church. For ventilation purposes the space occupied by the Floating-harbour would be most valuable, if the waters were less tainted with impurities.

A glance at the map will show that the prevalent winds being from the west and south-west, a considerable portion of the more crowded and lower parts of the city is not well swept by them.

Bristol is remarkably free from cellar dwellings. We observed so few that they scarcely deserve notice; so that in this respect the city is most fortunate.

*Distribution of Inhabitants.*—The following general view of the manner in which the different parts of the city and part of its suburbs

are inhabited, furnished by a competent authority, may be found useful.

*St. Philip's and St. Paul's—In and Out.*—The inhabitants of the *in-parish*, chiefly tradesmen, with a small proportion of mechanics, &c., in Redcross-street, Rich's-buildings, &c.—The *out-parish* contains a large proportion of the working population, chiefly in the south-west end of the parish.

*Redcliffe.*—Families of independence, opulent merchants, and professional men, in small numbers; tradesmen and persons of more moderate means numerous; minor tradesmen, artisans, and labourers very numerous; poor numerous.

*St. James's—Within and Without.*—Opulent merchants few; families of independence many; professional men numerous; chief tradesmen few; minor tradesmen and artisans many; poor very numerous. Many retired tradesmen in *St. James's Without*.

*St. Paul.*—Opulent merchants few; professional men and families of respectability many; chief tradesmen a small number; minor tradesmen, artisans, and labourers very numerous; poor numerous.

*St. Augustine.*—Opulent merchants, families of independence, and professional men, numerous; chief and minor tradesmen, and artisans, also numerous; poor not very numerous, except in the vicinity of Host-street, Trenchard-street, &c., and in the tenements between Limekiln-lane and the Floating-harbour, which are somewhat densely peopled.

*Castle Precincts*—Embrace the central parts of the city, and contain warehouses of merchants, the first-class shops, the banks of the city, merchants, attorneys, and other offices and places of business. The resident inhabitants chiefly tradesmen of the first and second class; poor not very numerous.

*Public Parks, Gardens, or Walks.*—There are no places for recreation supported at the public charge, but the banks of the river, from the Hotwell-house on one side and from Rowham Ferry on the other, afford ample opportunities of walking among the picturesque scenery of the Avon, and are, with Clifton and Durdham Downs, much frequented during Sundays and holidays.

*Supply of Water.*—Bristol and its suburbs, including Clifton, are supplied with water from pipes laid into the houses, from conduits, and from wells. Very little is accomplished by the former mode, and that only for the better-classed houses, more by means of conduits, but the chief supply is from the wells.

We are indebted to Mr. Samuel Stutchbury, of the Bristol Institution, for the following account of the water laid into the houses, and of the conduits:—

*Water laid into the Houses in Bristol.*—Jacob's Wells, on the side of Brandon-hill, seems to supply all, or nearly all, the water laid into the houses in Bristol. Two services of pipes proceed from them, one belonging to the Dean and Chapter of Bristol, supplying the premises attached to the cathedral, a part of College-green, Trinity-street, and two or three places adjacent; and the other to the Corporation, supplying the grammar-school, and perhaps one or two other places. The water is of good quality, rising from the beds of the upper part of mountain limestone series behind Belle Vue, but the volume of it laid on in this



way is but inconsiderable compared with that necessary for the supply of the city.

*Water laid into the Houses at Clifton.*—About 404 houses, all belonging to the more affluent classes, are supplied with water in this manner on Clifton-hill. Of these 304 receive their water from the wells at Sion-house, known as Sion-spring. It is there pumped up by a steam-engine, through a shaft sunk through the mountain limestone, 250 feet deep. The temperature is the same as that of the Hotwell water, which rises through the rocks near the spot whence the Sion-house water is raised, and it is believed to have the same substances in solution, being probably little else than a part of the same waters.

It is considered that double the number of houses might be supplied in this manner without altering the present arrangements of the pipes. It has been found by experiment that this well could afford 24 gallons per minute, or 33,560 gallons per day. Though many thousand gallons are given away in the dry seasons for watering the roads, and much to individuals, it would appear that not much more than half this quantity is now raised. The well was sunk about the year 1790, and until 1811, when pipes were first laid, the houses were supplied by means of water-casks.

About 100 houses are supplied from a spring, named Richmond-spring, near Richmond-terrace, and many of the new houses erecting in that vicinity are preparing to receive water from it. The proprietor states that this spring could supply the consumption of about 300 houses.

According to the evidence adduced these two sources could afford a supply of water to about 900 of the houses at Clifton, all of the best class, and 400 now avail themselves of them.

CONDUITS.—Of these there are several :—

1. *Redcliff*.—One very ancient, for the keeping up of which lands have been left, and this is done by the churchwardens of the parish. It is supplied from the lias, about a quarter of a mile S.S.E. from Lower Knowle. After a considerable course, the water is received in a tank at the corner of Redcliff church-yard, where there are cocks open to the public.

2. *St. John*.—Also an ancient conduit. It is supplied from a spring on the Millstone-grit, on the side of Brandon-hill, and is received in a tank at the top of Park-street. A main cistern anciently afforded water to the monastery of the Carmelites, the prior of which granted a feather pipe to the parish of St. John.

3. *Temple*.—Supplied from a spring apparently in the lias of Pyle-hill. Another ancient conduit. The parishioners used to maintain it from the profits of the Temple fair, granted them for this purpose. In 1840 the fair was suppressed by the corporation; but no compensation has been given to the parish to keep up the conduit. It was out of order when visited by us.

4. *The Quay Pipe, or Conduit*.—The water for this obtained from a withy bed, on the lias district of Horfield, north-eastward from the Orphan Asylum, between the high land of Ashley Court and the mill-stream flowing from the Boiling-well. After passing a considerable distance, it is received into a cistern at the bottom of Quay-street. Open to the public from seven to ten in the morning, and from three to seven in the evening.

5. *All Saints*.—The water rises from the upper part of the mountain

limestone, in Maudlin-lane, formerly in the garden of the Priory of St. James, and is conveyed by pipes into a cistern, with cocks, in All-Saints'-lane. The public had formerly free access to this conduit; but now the parishioners only have keys and the right to use it.

6. *St. Thomas*.—A good supply of water, received from the tank at Redcliff Church.

7. *Conduit on the Back*.—Rebuilt in 1725.

WELLS are scattered over the city and suburbs in all directions, except upon the country occupied by the mountain limestone, through which the waters find their courses by various fissures and passages to about the level of the sea. Of these wells many in the city are open to the public, as at the Back, Barton-street, Black Friars, Cannon-street, Currant-lane, Hollister-street, James-court, Broadmead, King's Head-court, Stephen-street, Thomas-street, White Friars, Wine-street, Narrow Weir, Old Park, Pembroke-court, St. Peter's pump, the Pithay, Princes-street, Quaker's Friars, Rose-alley, and Redcross-street.

These are not all strictly public wells, but there seems no check to the use of any of them; and some such as those in Wine-street, the Pithay, St. Peter's pump, &c., are in constant use by the public.

Wells with pumps are very common in private houses and in numerous courts; but in the latter situations we found a large proportion of them out of order. In several localities pumps of rain-water were observed, the water having been collected in tanks,—a method of preserving soft water too much neglected in our towns.

Mr. Stutchbury is of opinion that Bristol may be considered as fairly supplied with water for ordinary household purposes, but not with wholesome drinking water. The water from the Millstone-grit and upper parts of the mountain limestone series appears to be the best; but it is hard. That from the lias is considered next in quality. Good water is rarely obtained from the red sandstone series, being frequently brackish, and a large part of Bristol stands on this rock.

Tolerably good water was formerly afforded from the silt immediately underlying the gravels, peats, and clays of the alluvial flats of St. Philip, and Queen's-square; but latterly much of it has been tainted by persons sinking into the silt for the discharge of cesspool fluids, which thus become mingled with the silt waters.

It can scarcely be doubted that in many other localities than on the alluvial flats, cesspool fluids find their way into the wells. In the porous red sandstones this must often happen, affording as they do such facilities for absorbing them, and cesspools and wells are intermingled in the districts composed of this rock. The water from the ancient well or pump of St. Peter (formerly known as the well of St. Edith, and made by Canynge, the founder of St. Mary, Redcliff), in red sandstone, is considered better for making tea than those near it; a character perhaps due to the percolation to it of the filthy waters of the Frome and Float. When the Float water has been out, this well has been known to be pumped dry. In some courts of the Temple and other districts little care is taken to prevent the filth of the gutters from oozing into the wells; and in one place, in the Dings, we observed a privy immediately adjacent to the well.

The shipping is supplied by two floating tanks, or barges, the water being obtained from the River Avon, above the feeder for the Float, and



brought alongside the vessels, in which the casks, being stowed empty, are filled by means of flexible hose and fly-wheel pumps. The charge is about 1*s.* per puncheon.

There are no fire-plugs, except at Clifton, where the mains in connection with the Sion well or spring seem to have this provision. Thus Bristol may be regarded as ill provided with water against fires, except in the immediate vicinity of the Float.

The number of fires (usually termed working fires) in Bristol was, in the last six years, 108, being on the average 18 a year.

During the same six years there were 246 calls for fires, or 41 per annum.

There are seven fire-engines belonging to insurance offices, some of which are stated not to have any. Every parish has a fire-engine. One engine has 350 feet of hose, and is always kept full of water; and all the engines are worked and tried every quarter of a year in public places.

There are no rewards for the first intelligence of fires; but the public are described as ably assisting the firemen, always numerous during fires.

The desire to have Bristol more efficiently supplied with water appears to have been long felt, and Mr. Stutchbury states that an Act was passed in 1696, by which a Company contracted with the Corporation to supply the city with good water, at about 40*s.* a-year for each family. This Company formed a reservoir and erected a large wheel-engine at Hanham Mills; but it does not appear that the scheme answered the purpose of the projectors. According to the agreement, Bristol was to have been supplied with water for 200 years, and the Company seems to have paid to the Corporation 150*l.* and 164*l.* 13*s.* 4*d.* septennially for a long time. About 1783 the Company forfeited 500*l.* to the Corporation and closed their works. It is probable that the reservoir on Lawrence-hill was made by the Company.

From 1783 to the present time, though a better supply of water to the city by means of pipes has often engaged public attention, and meetings of influential persons have been held, nothing further has been accomplished. It was proposed to raise the water from copious and never-failing springs by the side of the Avon, between St. Vincent's-rocks and the Black-rock, and to tank it on the Windmill-hill, thence to let it descend over Clifton. In this manner high pressure might be kept up over a large part of Clifton.

It would appear that an Act, passed in June, 1811, for making a navigable canal between the cities of Bath and Bristol, also contained clauses for supplying the inhabitants of the city of Bristol and its neighbourhood with water; clauses apparently introduced for the purpose of giving a popular character to the bill, for they never seem to have been acted upon. Clause XXVI. provides that, if the Company does not construct the necessary works for the supply of water in 14 years, the powers granted for that purpose should cease; and accordingly they did cease, no such works having been constructed. This Act, in fact, can be considered as little else than one for forming a canal.

At a meeting in March, 1840, at which the mayor presided, it was proposed to form a Bristol and Clifton Water-works Company, and to raise 60,000*l.* in 1200 shares of 50*l.* each. In consequence, in November, 1841, notice was given that application would be made to Parliament in the then ensuing session for an Act to carry out the plans, which

seem to have been of an extensive kind. In this it would appear the Company failed.

Mr. Stutchbury suggests that good water could be obtained from several sources :—

1st. From the Ashton waters, a reservoir to be made at Ashton, near the Aqueduct, and a main to be conducted along the line of the Bristol and Exeter Railway, and thus supply Bedminster and the whole south side of the city, the elevation of the Ashton waters being about 70 feet above the city, south of the river.

2ndly. From the great spring at the mill opposite the Hotwell-house.

3rdly. From the spring emptying itself into the river at the Old Hotwell-house above mentioned.

These two last to be tanked on Clifton Downs, or at any convenient height.

4thly. From the Frome and Avon rivers, at convenient heights and distances.

Viewed as a sanatory question, there are few, if any, large towns in England in which the supply of water is so inadequate as at Bristol. From the evidence which has been laid before this Commission, it has been shown that the labour and consequent expense attached to the system of obtaining a supply of water from draw-wells or pumps engenders filthy habits, directly acting upon the health, and indirectly upon the morals of the people. The water of the pumps is generally hard and unfit for washing.

Hardness of water necessarily implies a very considerable expense in the waste of soap, or of carbonate of soda necessary to soften it, so as to render it useful for purposes of washing. This has led to the necessity of erecting tanks for rain-water, and has thus increased the expense of the supplies of water to the city. In fact, the inhabitants of many courts are either wholly dependent on the supply of rain-water, and are consequently much distressed in seasons of drought, or they obtain it from taverns or shops, the owners of which expect often more than an adequate return in the purchase of the articles vended by them.

It is probably considerably above the truth, that not more than 5000 persons, and these constituting the most wealthy families in Bristol and Clifton, are supplied with water by means of pipes laid on into their houses. On this supposition, 73,443 persons are wholly dependent on supplies obtained from public or private wells. In some parts of Bristol, in which the water is brought from the well by a water-carrier, the charges to the poorest family is at least 1*d.* per day; and it has been stated in evidence by Mr. Hawksley, that the labour of fetching water, estimated on the lowest average quantity used (seven gallons per head), amounts in money to 3*d.* per week for each family. Thus, without taking into calculation the annual expense of the interest of capital for wells and tanks, or the requisite sum to cover wear and tear, the annual expense for carrying water, as estimated by value in time, must be at least 9620*l.* to that portion of the town in which water is not laid on into houses by means of pipes. If the other expenses alluded to could be brought into the calculation, it would appear that the present system, even of a limited supply by wells, is much more expensive than the copious supplies afforded by Water Companies, as ascertained by the experience of Preston and Nottingham; in which towns the charge per



week amounts to from 1*d.* to 2*d.* for each family. It is quite obvious that the labour of fetching water naturally leads to a very sparing use of it. It cannot, therefore, be a matter of surprise that the interiors of the houses of the poor in Bristol are generally of a filthy description. Mr. Bayley, a city missionary, who is well acquainted with the district of Lewinsmead, states, that although there are not many complaints of a want of hard water, "the supply of soft water, so necessary for personal cleanliness, is totally inadequate to the wants of the inhabitants: the general habits of the poor in this district are dirty, and their homes uncomfortable." Mr. Gilbert, registrar of deaths, states, that "many of the houses are filthy in the extreme, the supply of water being very bad." Mr. Rogers, a surgeon, well acquainted with the habits of the poor in Bristol, describes the supply of water as "not plentiful, and often scarce;" and remarks that "*cleanliness cannot and does not exist.*" Dr. Budd, after pointing out that the filthy habits of the poorer classes in Bristol are mainly attributable to the deficient supply of water, shows, very judiciously, that the QUALITY of the water also acts in producing this result. He says, "Hard water curdles soap, and, to the same extent, destroys its cleansing properties; the poor can never be made to use it for washing, unless when there is no other to be had. Where, therefore, the pump or spring water is hard, they are left to the scanty and irregular supplies furnished by rain, which are quite insufficient for constant use. *Hard water, however unlimited the supply, is consequently of very little service in promoting cleanliness.* The truth of this remark may be abundantly seen in this city." The general character of the well-waters in Bristol is that referred to by Dr. Budd.

A personal inspection of very many dwellings of the poorer classes in Bristol satisfied us that the previous remarks, as to their filthy condition, is by no means overrated. The filthy state of the habitations we ascribe wholly to the want of means, and not to any inherent habits in the people themselves, from whom we, in very many instances received loud complaints on this subject.

*Baths.*—There are several private baths, but so expensive as to be beyond the reach of the poorer classes. There are, however, a few cold swimming-baths, which may be used at moderate prices.

The first of these is known under the name of Renison's Baths, being kept by a man of that name. They are situated at the end of Stoke's Croft, in the out-parish of St. Paul, in a place, therefore, at a considerable distance from the densely populated districts. In this establishment there is one large swimming-bath for gentlemen. It is about 30 yards long and 20 broad, varying from 4 to 6½ feet in depth; the water is clear and good, and in large quantity, entering at one end and flowing out at the other. The charge for bathing is only 2*d.*, or 3*d.* if a towel be given. To this establishment is attached a ladies' bath of small dimensions; but this is scarcely ever used.

To the gentlemen's bath, in hot weather, there is an average of 20 to 30 people per day; but the proprietor states that this number is now much on the decrease.

The other baths are enclosed parts of the river Frome, attached to public-houses. The charge for these is from 1*d.* to 2*d.*; but the vicinity of the public-house does away with any benefits arising from bathing. There are, therefore, no public baths, properly so called; all

those alluded to being kept by private persons as a matter of speculation.

*Habitations of the Poorer Classes.*—The want of the facilities for internal cleanliness in houses is to be regretted the more on account of the density of the population in many parts of the city. The number of persons to each house in the whole city is 6·1—a number nearly as high as the proportion found to exist in the crowded towns of Manchester and Liverpool. It is of frequent occurrence to find one room occupied by a family consisting of five or six individuals. In fact, this is described to be the general condition of dwellings in many of the poorer districts, as shown in the following portion of evidence of Mr. Bayley:—

“What is the general condition of the dwellings of the labouring classes in Lewinsmead?—Most families occupy one room, some two small ones; very few have more, not being able to afford the rent. These (in summer-time especially) are very hot and ill ventilated, owing to the common practice of *fixing* the upper sash, and thereby preventing a good circulation of air.”

Mr. Bayley considers that the low moral tone of this district is in a great measure fostered by the neglect of the decencies of life, which this overcrowding and filth necessarily implies.

Mr. Gilbert gives a similar account of the Redcliff district, adding that he finds very little regard paid to the separation of sexes in the same apartment.

It was to be expected that the overcrowding and deficient state of ventilation must operate very prejudicially on the health of the inhabitants; and accordingly we find these circumstances severely commented on by medical witnesses, as shown in the following portion of evidence of Mr. Stephens:—

“Are the apartments of the poorer classes properly ventilated?—The apartments of the poorer classes are not properly ventilated, especially in severe weather; for custom will reconcile the inhabitants to a close and foul atmosphere, but cold cannot be borne, and thus every window is kept closed to render the room as warm as possible. I have noticed that after a long continuation of frost, fever always appears in a malignant form among the poor, from the reason just stated, I presume.”

Dr. Budd refers in the following terms to this density of population, and bad ventilation of their dwellings, as a great means by which fever is propagated:—

“It is clear enough that diseases which propagate by communication from one person to another must spread most where people are thickest. Now, in almost every instance in which I have witnessed contagious fever in Bristol, there has been only one bed-room to each family; and in many this was the only apartment. Several persons consequently occupy each bed; and in almost the last case of fever which I attended, there were four ill of the disease in one bed. The first attacked had communicated the disease to the others. Unfortunately the want of common cleanliness, and the absence of sufficient means of ventilation, act in fatal alliance with these conditions. The lower classes of people in Bristol are, generally speaking, very dirty in their habits. They hardly ever whitewash their rooms, but seldom change their bed or body-linen, and their persons and sleeping apartments are much infested with fleas and other vermin. But it is particularly lamentable that after a fever or other contagious disease has been through a house tenanted by persons of this class, no additional means of purification, much less any



express measures for the extinction of contagious effluvia, are resorted to. It is astonishing that this state of things should be allowed to continue when the frightful consequences are so evident, the means of averting them more or less completely so obvious and easy of adoption, and their enforcement a matter of such great moment to society. We protect ourselves, by all manner of stringent legislation and heavy penalties, against nuisances merely offensive to sense, and yet, without complaint or interference, allow our neighbour to harbour the seeds of pestilence.

House-drainage in the poorer districts of Bristol is almost unknown. Courts are frequently connected with the main sewers by drains or "gouts," as they are termed; but these in almost every instance act inefficiently from the deficient supply of water. As a consequence of this state of sewerage, water-closets exist only in the houses of the more wealthy part of the community. A deficient supply of privies, occasionally in bad repair, and very often filthy, forms the only means of accommodation for the poorer classes. In some districts which we examined, we found as many as one privy to every two houses. In other districts, the proportion was three privies to 14 houses; and in several instances the supply was still more scanty. There are no regulations for cleansing privies, except an implied private understanding, that each of the neighbours enjoying the advantage shall cleanse them in rotation. The consequence of this is, that the cleansing is frequently much neglected. We observed numerous instances in which, from the bad position and construction of the privies, the ordure had penetrated through the wall of the adjoining dwelling. One instance of this kind we may advert to more particularly:—the family of E. S. inhabits an underground kitchen in Lewinsmead. Opposite the door of this kitchen, the ordure of an adjoining privy has permeated. The room is badly ventilated, and its inmates appear wan and sickly; they ascribe their bad health to the emanations of the privy, as shown in the following evidence of the mother of the family:—

"How long have you resided here?—Nearly two years.

"Have you enjoyed good health since then?—No, all our troubles have come on us here. I used to be strong and lusty—able for work; but now I am weak and sickly. I have had many children, and never suffered from my confinements till I came to this place; but since then I have had two dead-born children. But what distresses me so much is, that my children, who were healthy before, are becoming very puny; and my husband is not able for the work he used to do. God has dealt hardly with us for two years.

"Is the smell from the privy always as bad as it is now?—Generally much worse. Mr. ———, the missionary, when he comes to visit us, has often to put his head out at the window, he gets so faint. I think, somehow, that we are worse when the smells are worse. My husband and I have begun to think of this lately, and we are about to move, to see if we can get better."

Instances of a similar kind to the above have frequently come under our notice.

It is unnecessary to describe in detail the lodging-houses of Bristol, which present no features which are not characteristic of such establishments in other towns. In Bristol, as in other large towns, the lodging-houses are conducted on the principle of crowding the largest number of people into the smallest possible space, generally without regard to

distinction of sex, or even of the most ordinary decencies of life. In several rooms we found as many as eight or ten beds, each of them containing at least two persons, occasionally more, but the average number of beds to each room is probably not above four. In one or two instances we observed cases of contagious disease, such as scarlatina and synochus, without any attempt to prevent the extension of the disease. Medical witnesses describe these lodging-houses as the foci from which fever spreads to the surrounding districts. They are not subject to any regulation; and the consequence is, that the filthy state of the interiors of houses already alluded to is exhibited in an increased degree in these resorts of vagrants. As the state of lodging-houses in Bristol, as well as in other towns, will be shown in another report, we consider it unnecessary to enter into detail on this subject.

*Health of Inhabitants.*—In the elaborate analysis of the registries of death, detailed in the report of Dr. Kay, the general condition of the town of Bristol, with regard to health, is exhibited. The great mortality and loss of life in Bristol, inferior only to Liverpool and Manchester, is not to be wondered at, when we consider its deficiencies in a sanatory point of view. The Returns, published by the Registrar-General, show that the mortality in Bristol is 3·1 per cent., or 1 in 32 of its population. As the mortality in districts of an average degree of salubrity is found to be 2 per cent., there has been an *excess* of mortality in Bristol during the last five years (estimating the mortality at 2·9 per cent., the average of the last five years) equivalent to 3083 deaths. Dr. Kay has shown in his Report that a large proportion of the excess of deaths is due to infants, who are peculiarly prone to be affected by the various causes of mortality to which we have referred. But the evil is not by any means confined to the infantile population. The average duration of adult life is also materially diminished; and, what is perhaps of equal importance, the enjoyment of life and working ability of the survivors are materially affected.

It will be seen by the tables, that certain districts of the city are marked by having a higher mortality and a shorter durability of life than other localities more favourably situated in their sanatory condition. Medical witnesses, from their experience in these districts, attest the same facts, and, in almost every instance, agree in tracing them to removable causes. This is shown in the following portions of evidence from various medical men. Mr. Swayne particularly refers to the deficient state of drainage as a cause of disease:—

“Can you specify any particular parts of the city peculiarly liable to contagious or eruptive fevers, or other forms of disease?—I have observed that epidemics and contagious (?) fevers, denominated ‘gastric,’ ‘enteritic,’ ‘bilious,’ ‘choleric,’ &c., together with common cholera and dysentery, to prevail most in those parts of the city where the drainage is bad, and in the neighbourhood of the different small branches of the rivers, particularly the Frome, which are nothing better at present than common sewers; but it is in the suburbs, where there is no drainage at all, that I have seen worst fever,—such as the vicinity of Montpelier, and Ashley Vale, where there is a most offensive ditch; the neighbourhood of the Black-boy at Durdham Downs, and some parts of Clifton, particularly Richmond-terrace, where the practice of making cesspools and reservoirs for the sewage prevails.

“Do you recollect any marked instance in which the deficient state of drainage was accompanied with fever?—I had a very remarkable instance



last summer, in an institution which I attend,—the Female Orphan Asylum, near the large ditch or brook in Ashley Vale, which I mentioned in my last answer. During the dry weather in the latter part of the summer, the ditch, which receives all the sewage in the neighbourhood, became very offensive, in consequence of there being no water flowing through it; a fever then broke out very suddenly, 10 individuals having sickened at once. We had, in all, 24 cases among 60 persons. The fever continued without any abatement, notwithstanding every precaution was taken to prevent its spreading, until, by the fall of copious rains in the autumn, this brook was filled with a stream of water, when the fever immediately ceased, no such case having arisen since.”

Mr. Henry Stephens refers to the state of the Frome as very injurious to public health :—

“ Will you state the districts in which fever most abounds?—I have marked on a map the spots where fever most frequently occurs; and these will be seen to be along the Frome from the Weir to the Stone-bridge; not only the most numerous, but the worst cases of typhus occur in this tract. I am certain, public health is much injured by this filthy stream remaining uncovered, especially during the hot months. With regard to the Float, the waters of the Frome pour into one branch of it, when they stagnate, and the stench of this in the summer and autumn months is too notorious to need any remark. By referring to the newspapers of last summer you will see repeated complaints made by the inhabitants of St. Augustine Parade respecting this nuisance, and that some disease had appeared, which was attributed to the fetid exhalations from the Floating Harbour, and that some of the tradesmen had been compelled to remove their families on account of this annoyance.”

Mr. Rogers states, that while he cannot say that the smells of the Float, “ which are occasionally very bad,” have originated fever, yet he has “ little doubt of that circumstance tending, in conjunction with others, if not to excite, certainly to aggravate disease.”

Dr. Budd, after pointing out in strong terms that deficiency of diet is one great cause of disease in the lower districts of Bristol, at the same time draws attention to the very injurious consequences which arise from the exposed state of the river Frome. He refers to the great amount of sickness in the houses situated on the banks of that filthy stream, “ especially because the inhabitants are in station considerably above the lowest class.” He points to these evils in the following evidence :—

“ Along the whole course of this stream, or, more correctly speaking, this ditch, is a source of noisome effluvia, which in the summer season sensibly poison the air for a long way round. In many parts, the aspect of the ditch and its banks, loaded with impurities of all kinds, is disgusting in the extreme. Between St. John’s bridge and the bridge at the Quay-head the nuisance reaches its climax. The inhabitants of Christmas-street are the great sufferers. Part of this street is built on a bridge thrown across the Frome, between the two already mentioned. I am now attending two families in this street, in the houses Nos. 12 and 16: these houses are nearly opposite, and being built on the bridge, the backs of them overlook the stream in opposite directions. At the back of each is a gallery, built of wood, which projects from the wall of the house, and overhangs the ditch. In the corner of each gallery is a privy. From both there is a view of a range of other privies, up and down the stream, belonging to houses which abut upon it. These privies hang over a bank of mud, the level of which is only swept at spring-tide, or when the Frome is swollen

by freshets. The state of things in the interval is too loathsome and disgusting to describe.

"When the tide comes up, matters are, for the time, still worse; for it comes loaded with the filth discharged from the sewers that open further down. The stench then becomes almost intolerable. A short time ago I visited the house which looks down the river, when it was nearly full tide. The room in which my patient lay overlooked the stream; and, as the window happened to be open, the stench was so overpowering that I could scarcely stay there. The inmates, however, from being so long accustomed to the smell, did not perceive it.

"The construction of the opposite house is still worse. The gallery at the back is here closed in, and made into a scullery, lighted by a small window; it is, consequently, not swept by the open air, as that on the other side. The floor is full of large chinks, through which the ditch below is visible, and noisome effluvia enter undiluted. This is a most poisonous place. As if to unite in one spot every condition unfavourable to life, the day-room of this house is almost dark, having only a borrowed light from the scullery behind, and from an obscure shop in front. I need scarcely add, that all the people here are unhealthy. The inmates of these two houses told me, that the most healthy people coming to live here very soon droop, and lose their good looks. They become pale and weak, and suffer much from indigestion. The wan looks of my informants fully bore out their statements.

"I was not surprised to find, too, the interior of these houses kept in a very filthy state, and the people extremely dirty in their persons. Cleanly habits cannot long survive the contaminating influence of such conditions. People living among them necessarily become filthy, coarse, and brutalized."

Some witnesses supposed that the low state of morality to which Dr. Budd refers, ought, in many instances, to be considered the main cause of disease in these localities. But such witnesses had not considered, that the very inducements to excess in stimulating drinks found their origin in the depressed state into which the inhabitants are thrown by unhealthy physical agencies. It is quite true that, in the localities alluded to, the money which ought to be spent in effective nutriment is too often expended in alcoholic stimulants, or even in tea—a stimulant much less injurious, and much resorted to in these and similar localities; but the very appetite for such stimulants is a sign of depressing physical agencies. Mr. Bayley, the city missionary, whose evidence has been already cited, after having spent years of almost hopeless labour in these unhealthy districts, states, that the great obstacle to the success of his mission is the lax state of morality created and fostered by the want of facilities for cleanliness and neglect of the decencies of life. He finds that the habits of cleanliness and morality taught to children at school are, in a great measure, neutralized by the state of filth and overcrowding which they meet with in the houses of their parents.

Several registrars of deaths refer to this overcrowding as causing very injurious consequences to morals and to health, in the case of death, as shown in the following portion of evidence of Mr. Gilbert:—

"What is the usual period that bodies are kept disinterred in your district?—From 5 to 8 days, and I have known them kept 12 days.

"Why are they kept so long?—In many cases, from a foolish idea that greater respect is shown to the dead, but more frequently from the expense of burying them earlier, arising from the difficulty of obtaining the attend-



ance of persons on any day but Sunday. Thus, if a person dies on Thursday, he would not be buried till the Sunday-week following.

“Does the family live and sleep as usual in the room containing the dead body even after it has acquired an offensive smell?—Not generally; but I have met *with many* such cases.

“On entering an apartment in which the family did remain as you describe, has your own health been affected?—Yes, frequently. I have sometimes been made very ill.

“Have you perceived any injurious effects to the occupants of the room?—I have known persons to be very seriously affected, and in several instances I have seen additional deaths occasioned by the retention. In fact, the smell sometimes becomes so bad that applications have been made to me by the neighbours to see whether I had not the power to compel burial.”

As the interment in towns has been made the subject of a separate inquiry, we need only refer to the circumstance, that, in addition to the church and chapel burying-grounds, several of which are in a very crowded state, there are some burying-grounds in Bristol kept by undertakers for the purpose of speculation. Witnesses have stated, that the scenes which occur in these, for the purpose of obtaining room for burials, are not only highly unbecoming, but likely to be productive of very injurious effects to the health of the immediate neighbourhood. One of these witnesses, a labouring man, who officiates over the funerals instead of a clergyman, describes the state of the ground when a grave is opened in terms almost incredible. A personal examination of these burying-grounds has led us to the conviction, that the retention of burying-grounds by private individuals, as a matter of speculation, is productive of much injury, not only to morals, but also to the health of the localities in their vicinity.

Slaughter-houses in Bristol are scattered over the town without any special regulations. Very frequently they are situated in unventilated courts, and are much complained of both by medical witnesses and by the inhabitants of the courts themselves.

The manufactories are generally situated towards the eastern side of the city, in a direction, therefore, opposite to the prevailing winds, and are not, on this account, considered as productive of injury to the health of the city. Yet although this is not the case, Bristol, with a climate known to be mild and salubrious, enjoys the unenviable celebrity of being the third most unhealthy town in England. The poverty of its inhabitants cannot be the cause of its low position in the scale of health, for as Mr. Brady, the surgeon to St. Peter's Hospital, remarks—

“It is probable that the poorer classes (in Bristol) are not subject to such extreme destitution as in some manufacturing towns. This arises from various causes. Bristol not being a manufacturing place, the labouring classes are not subject to fluctuations between high wages and total want of employment; therefore large masses of artisans, suddenly reduced to a state bordering on starvation, are fortunately unknown to us. Besides, Bristol, being an ancient city, possesses many charitable endowments, and the distribution of these funds preserve many families from suffering from the want of the absolute necessities of life.”

As the climate is salubrious, and poverty not peculiarly severe, we can only look for the causes of the unhealthy state of the city in the neglect of proper sanitary conditions. We have seen these to be, bad drainage and sewerage, deficient supplies of water, bad structural ar-

rangements of streets and dwellings, and overcrowded state of the population. These are, in a great measure, removable causes, and most of them are within the recognised province of legislation. The powers at present possessed by the authorities of the city are quite inadequate for the removal or even material abatement, of these evils.

The Sewerage Act does not provide for a systematic drainage of the unimproved districts of the city, and does not afford powers of improving unhealthy districts at the expense of the owners of property in these districts ; neither does this Act comprehend a necessary union of house drainage with public sewerage.

By the 15th clause of the 1st Vic. sess. 1837, powers are given to prevent the pollution of the rivers Frome and Avon by conveying into them "any noxious or offensive materials or ingredients, or any substance whatsoever"—with what small effect is shown by the complaints of the medical witnesses, whose evidence has been cited.

By an Act 3 Vic. sess. 1840, intituled "An Act for regulating the Building and Party-walls within the City and County of Bristol, and for widening and improving several Streets within the same," the Council are empowered to purchase houses and lands for the purpose of widening and improving streets, and for regulating buildings and the strength of party-walls ; but it does not provide any effective sanitary measures, unless similar clauses to those contained in the last Act, for suppressing nuisances offensive to the senses, be deemed worthy of this name.

When we consider the magnitude of the evils described, the great unnecessary waste of life, necessarily entailing heavy pecuniary burdens on the community, and depressing the physical condition of the survivors, few will not agree to the concluding passage of the evidence of Dr. Budd on the state of Bristol :—

"It is high time that society should show, by the magnitude and liberality of its provisions, its deep sense of the importance of cleanliness to the health and happiness of the people. When the public can once be brought to see, in all the clearness in which the truth appears to medical men, that the present prevalence of dirty habits among the poor involves the premature and miserable death of thousands of the most useful members of society by fever and other disorders, it will become evident to all, that too great a sacrifice cannot be made, in order to provide the lower classes with the means of cleanliness, and to promote its practice among them."

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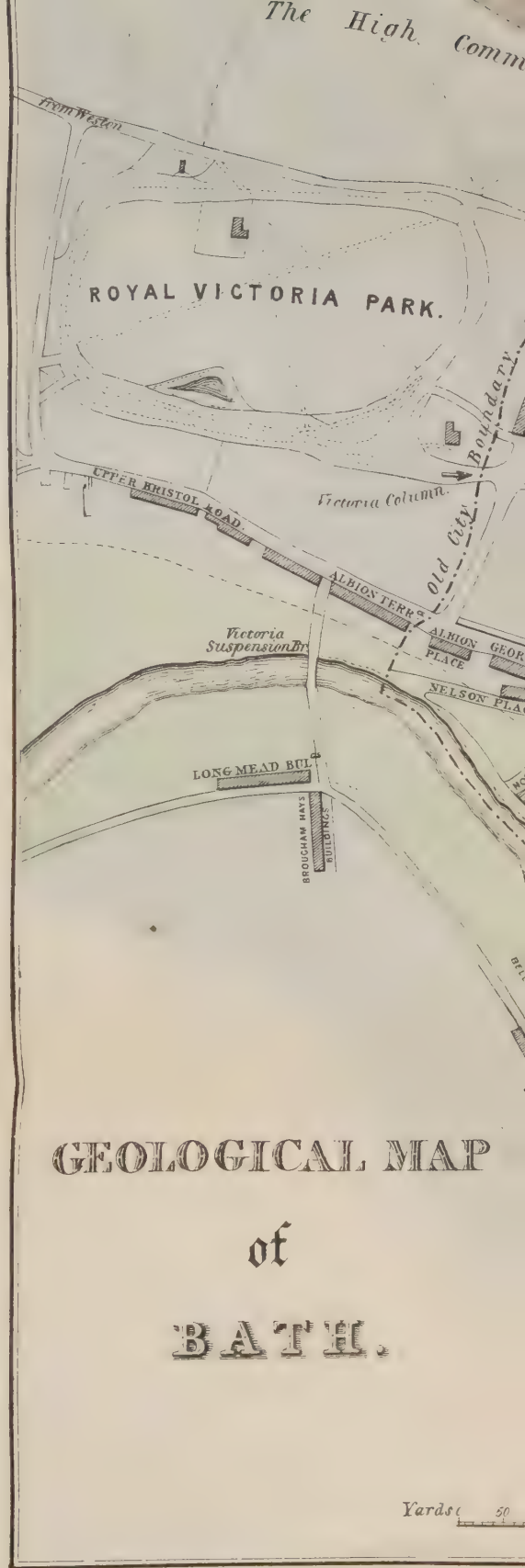


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# GEOLOGICAL MAP of BATH.

Yards 50





# REPORT on the SANATORY CONDITION of the CITY of BATH.

BY SIR HENRY T. DE LA BECHE.

*Situation.*—Bath is built partly on the slope and lower part of a hill, rising from the right bank of the river Avon, where it forms a considerable bend round from east and west to north and south, the more ancient portion being at the bend, and on the lower ground, and partly on the eastern bank of the same river, but on this side rising, except as scattered villas and minor ranges of houses, to a less elevation than on the right bank.

Lansdown, forming the continuation of the hill on which a large part of Bath stands, is elevated about 800 feet above the sea; and, viewed from the Wells Road, the city has a striking appearance, its various crescents and ranges of houses rising above each other from the lower ground to the crest of this range of hill. The bulk of the buildings shade off, as it were, by means of detached ranges of houses and villas, the latter dotted thickly about the outskirts of the city.

It is a handsome town, and from the abundance and small cost of the stone quarried around, and the facility of working it, houses are easily constructed; and even when small, present a better appearance than those of the same character in most towns.

The Avon is navigable up to Bath, and the navigation is continued by the Kennet and Avon Canal into the Thames; so that the city possesses water communications with Bristol on the one side and London on the other.

*Climate.*—From the sheltered situation of a great part of the town from the northerly winds, while the same portion is freely swept by those, and they are the most prevalent, from the westward and southward, at the same time that other parts of the city are open to the eastern winds, and such northerly winds as find their way down the valley of the Avon, with the variable heights of the houses above the bottom of the valley, such obvious causes for difference of temperature are afforded in different parts of Bath, that observations respecting it, in one part of the town, may vary much from those in another.

A table showing the mean temperature has been kindly supplied by Mr. Biggs, chemist, in the lower part of the town, from June 1841 to July 1843.

As far as this table extends it gives the mean temperature of the months for the two years, as follows:—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
38°·5	39°·5	45°·5	49°·5	53°·5	60°·5	63°·5	66°	59°·5	48°	44°·5	45°·5

This would give an annual mean for the two years of  $51^{\circ}\cdot 2$ , which appears small for the lower parts of Bath, the mean annual temperature of which we should not expect to be less than in the lower portion of Bristol, namely  $53^{\circ}$ , though  $51^{\circ}\cdot 2$  may approximate fairly to the annual mean of a large part of Bath.

The fall of rain in the same period from June 1841 to June 1843, was in the first year  $42\cdot 36$  inches, and in the second year  $39\cdot 63$ , giving a mean of  $40\cdot 99$  inches.

This would give a greater mean annual fall of rain than for Bristol, for which the mean of 16 years is  $32\cdot 92$  inches. It is thought that the fall of rain is somewhat more at Bath than at Bristol, but it requires better observations to establish this than have hitherto been made. Mr. Biggs considers that the fall of rain observed for the two years noticed is above the average, which he estimates at about 32 inches per annum. It is probable that the climate of Bath does not materially differ from that of Bristol. Like the latter it may, as a whole, be regarded as mild and moist. Mr. Field, surgeon of Bath, observes, "It is certain that the climate of Bath is damp. The south-westerly breezes, as they pass over the hills of the neighbourhood, deposit a considerable quantity of the water which they waft from the Atlantic."

*Geological Structure of the Country on which the City stands.*—The nearly horizontal beds of clays, limestones, sands, and sandstones on which Bath stands, constitute a portion of the series of rocks to which the term oolitic has been given from the oolite or oviform grains in many of the limestones. The city and its environs are indebted for its appearance to the limestone beds, named the Bath oolite, extensively quarried in the neighbouring hills, especially on Claverton and Combe Downs. To these beds, for there are several, succeed a considerable thickness of clay, known as the fullers'-earth, from a minor portion of it furnishing real fullers'-earth, much employed in the cloth manufactories of the neighbouring towns of Bradford, Frome, &c. Richmond Hill and Mount Beacon, in the higher and northern side of Bath, are upon this clay. Beneath the fullers'-earth clay appears the limestone known as the "inferior oolite." The upper part of Sion Hill, Lansdown-crescent, Springfield-place, Rock-house, Lansdown-grove, &c., are upon this limestone, one based on sands, termed the inferior oolite sands, which are not so thick at Bath as at some other localities in the vicinity. They form steep ground ranging under the escarpment produced by the inferior oolite limestone. The lower part of Sion Hill, All Saints' chapel, and part of Lansdown-road, are upon these sands, which also form the escarpment behind Upper Camden-place. Still in the descending order of the beds, occur those known as marlstone, being an indurated condition of calcareous marl mingled with sand, some clay being intermingled. Cavendish-crescent and place, the higher part of Park-street, part of Lansdown-road, Camden-place, Upper Camden-place, the back of Prospect-place, with Stanley-place are on the marlstone. The rocks above enumerated, therefore, support the higher parts of Bath on the north side of the river.

All the rest of Bath, consequently the great mass of it, is built on the marls, and argillaceous limestones, known as the lias, with the exception of Pulteney-street, Sidney-place, Bathwick-street, and other streets and places adjacent on the left bank of the Avon, with the



various buildings on the Dolmeads and the Parades; the bottom of Southgate-street, parts of Avon, and Milk-streets, King's Mead-terrace, Green-park-buildings, and Norfolk-buildings, and Crescent, on the right bank of the river, which stand on alluvial ground, in a great measure composed of clay.

The buildings on the oolitic limestones and sands are on dry ground; on the marlstone it is more moist, and on the lias and alluvial ground it is naturally damp. On the lower ground, however, where the latter character would otherwise be much felt, the accumulated buildings of centuries, and the vaulting on which the houses are erected, much prevent the damp character of the ground beneath from being injuriously felt above.

As might be anticipated from the interstratification of the different kinds of rock mentioned, conditions for the occurrence of springs are numerous, and accordingly they are not uncommon, and from them Bath is supplied with water for domestic purposes, wells to cut the lines of water beneath the surface being also formed.

With the exception of the alluvial flat at the bottom of the valley, the ground upon which Bath stands affords great natural facilities for drainage.

*Floods.*—That part of Bath which is built upon the alluvial flat at times suffers severely from floods, in a great measure produced by the artificial obstructions which have been raised by bridges, by encroachments on the banks of the river, and by mill-dams or weirs, to the natural discharge of the river waters. Mr. George, town-clerk of Bath, in his answers, on the part of a committee of the town-council of Bath, to the questions forwarded to him from the Commissioners, observes, respecting the liability of the town to flood:—

3. "It is, the lower part particularly. In the time of snow, very considerably."

4. "There are (obstructions to the natural drainage) from several weirs across the river."

The floods are much felt in the tenements, (nearly altogether occupied by the poorer classes,) erected outside the city boundary, on that part of the alluvial flat of the Dolmead, where the discharge of the floods, from the bridges, and encroachments on the river towards the quays, is much impeded. The houses in New-street, Dolmead, are so sunk in many places as to be beneath the water-level in high states of the Avon, and in floods they are inundated.

It is stated that the floods during the last 25 years have generally increased from the many encroachments in different places on the banks of the river, and from the multiplication of bridges. The quay on the town side, above the old bridge, is represented as an encroachment made about 18 years since.

It appears from a report of Mr. Telford to the corporation of Bath, on the improvement of the Bath bridge, dated August 1823,—

"That in the great flood of 1809, the water, at 90 yards above the bridge was higher than 153 yards below it, by 2 feet 9 inches.

"This difference of head could not arise from the want of water-way at Bath-bridge; because it is six feet more than that of Pulteney-bridge, and more than the channel either above or at some distance below the bridge.

"The true causes are, that the arch next the south abutment has half its width encroached on by a projection of masonry, while, on the north side, the river-bank forces the current obliquely against the piers, thereby lessening the effect of the water-way, and throwing the greatest weight of water against the obstructed arch. The northernmost arch is, also, thus prevented from performing its office until the flood-water has acquired the before-mentioned head.

"From the foregoing statement of facts, I infer that, were the obstructions on each shore removed so as to permit the water to pass directly through the arches, no head would be created, but a regular inclined plane preserved, and therefore, that no alteration (in the arches of the bridge) is required on account of the water-way."

Obstructions near the bridge still continue, and though great care has been observed in constructing the adjoining bridge for the Great Western Railway, all the artificial arrangements in this part of Bath and at Twerton weir below, tend to impede the free course of the flood-waters.

*Drainage and Cleansing.*—There is no plan of Bath, for proper levels, for building, sewerage, or other structural purposes. There are Commissioners for the out-parish of Walcot, who have powers, under a local Act, to construct sewers, and somewhat more than one-fifth of the city comes under their jurisdiction for this purpose. For the remainder of the city there is a total absence of public powers for drainage and sewerage; a singular state of things for so large a town.

The present drainage, for at least three-fourths of Bath, may be considered as little else than the result of adjustments among the various proprietors of the ground and houses at different times among each other; a fact sufficiently remarkable when it is considered that this city has long been the resort of persons in easy or affluent circumstances, and that it contained, in 1841, a population of 53,206 persons.\*

Respecting the drainage and sewerage of Bath, Mr. George observes:—

6. "There are no settled regulations for draining the town. The streets, courts, and alleys are paved, and have generally sufficient inclination for surface drainage. In the more distant part of the environs there may be a few open ditches that receive the drainage of cottages, but none near the town. I know of no stagnant pools."

7. "The under-drainage is partially effective. There are main sewers either in the streets or in the areas of the houses, or behind the houses, with collateral or branch-chains, from the houses into them."

8. "The houses are well supplied with necessities: they empty into drains, and rarely require cleansing, except from stoppages arising from accidental circumstances. There are no public necessities."

9. "The house-drains are cleansed by the water from the roofs, and wash-houses passing through them, but are occasionally obstructed."

10. "Some of the public or main sewers are occasionally obstructed by deposits arising either from their inadequate size or want of current, or both causes combined; but this does not often occur."

"Traps to prevent the escape of smells are plentifully used."

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\* It would appear that, when Queen Elizabeth visited Bath, there was no common sewer in it; and this town, now large and handsome, is represented to have been a poor place in 1670.



11. "The Commissioners for the out-part of the parish of Walcot have power under a local Act, to order the construction of new sewers and the alteration and reparation of old ones, where they see occasion; their power extends over about a fourth or fifth part of the city. There is no such power vested in any body for the remainder of the city."

12. "All the drainage of the town is conducted into the river, except in a few cases of old houses and a portion of new buildings, the suburbs having cess-pits."

With reference to the form of the sewers and drains, Mr. George remarks that they are—

13. "Rectangular; the house-drains from 6 inches square to about 12 inches by 10 inches; main sewers from about 12 inches by 14 inches to 2 feet by 4 or 5 feet, the prices varying accordingly; a drain of 12 inches by 14 inches would cost 1s. 6d. per foot running measure."

14. "When the main sewers require cleansing they are opened from the surface, and the deposit taken out and carried away."

The following are answers to the Commissioner's questions relating to the drainage of Bath, which have been received from Mr. Philip Duncan, well known for his philanthropic character and for his desire to promote all useful and public works at Bath:—

6. "The upper part of the city is well drained; but several streets in the lower part, from their situation and from negligence, are insufficiently drained."

7. "There are sewers, but imperfect."

8. "Many poor houses are defective in necessities. There are no public necessities."

9. "Many house-drains bad."

10. "The drains are covered, but frequently obstructed."

Though so defective in arrangements to insure a general and proper system of sewerage, Bath, as a whole, is well paved, and fairly cleansed, as regards the duties of the scavenger, though in this respect also there is a want of a general system. In the matter of cleansing power (scavenger duties,) instead of there being no commission for Bath, there would appear to be too many, and a consequent want of co-operation and an unnecessary expense of officers required for the purpose.

The following letter from the town-clerk of Bath to the Secretary of the Commission, points out the Acts under which the paving, cleansing, &c., are carried out, and the present faulty and conflicting state of the regulations in force, resulting from the number of district Boards:—

"SIR, "Bath, 5th February, 1844.

"In reply to your inquiry respecting the Local Acts which now exist for the government of this city and borough, I beg to inform you that there are four, and which are described in Schedule E to the Municipal Corporation Act, viz:—

"33 Geo. III., c. 89.—'An Act for paving, cleansing, lighting, watching, and regulating the streets, squares, lanes, ways, and passages, and public places within such part of the parish of Walcot, in the county of Somerset, as is not within the circuit, precinct, and jurisdiction of the city of Bath, in the same county; and for removing and preventing nuisances, annoyances, encroachments, and obstructions; and for establishing a proper and effective police therein; and for licensing and regulating hackney-coaches, chairs, porters, basket-men and basket-women within the said city of Bath, and a certain distance thereof.'

“ 41 Geo. III., c. 126.—‘ An Act for paving, steining, cleansing, watching, lighting, and regulating the streets, squares, lanes, ways, passages, and public places within the parish of *Bathwick*, in the county of Somerset, and for removing and preventing nuisances, annoyances, encroachments, and obstructions, and for establishing a proper and effective police therein.’

“ 54 Geo. III., c. 105.—‘ An Act for better paving, cleansing, lighting, watching, regulating, and improving the *city of Bath*, and the liberty and precincts thereof.’

“ *Note.*—This Act embraces the parishes of St. James, St. Michael, St. Peter, and St. Paul, and a part of Walcot, which comprised the city of Bath before the passing of the Municipal Act.

“ 6 Geo. IV., c. 74.—‘ An Act to amend an Act of His late Majesty for paving, cleansing, lighting, watching, and regulating the streets and public places *within such parts of the parish of Walcot, in the county of Somerset, as are not within the city of Bath.*’

“ Some of the Commissioners for the execution of these Acts are elected for life, others for five years, and seven are annually appointed out of the town-council to assist the other Commissioners in the execution of the Act 54 Geo. III. Under each of these Acts there is a separate establishment of clerks, surveyors, and other officers for carrying them into execution. These Acts being very differently constructed, I consider it unnecessary, for the present purpose, to show the various or particular discrepancies and dissimilarity, but merely to state, that offences are described and punishable under one which are not offences under another; and for those offences which are punishable under *all*, the penalties vary in amount from 10s. to 5*l.*; and that, in fact, what is an offence in one part of the borough is not in another. The manner of repairing the streets, &c., as provided by these Acts, is considered objectionable, and requires alteration and amendment. In some instances there is no power of steining, and the expenses are paid by individuals instead of a general rate.

“ The city and borough of Bath, as extended under the Municipal Act, contained, in 1841, a population of 53,209 persons. The parish of Lyncombe and Widcombe, which is immediately contiguous to the old city, and now forms a part of the borough, contains about 15,000 persons, and is not under the regulation of either of the above Acts, but is subject to the General Highway Act. The inhabitants of that part of it which is watched by the borough police contribute towards the expenses of such watching, but the lighting of the same part is paid out of the borough fund. The lighting in the other parishes is under the direction of the Commissioners named under the above Acts, and is paid for by a separate rate on the inhabitants.

“ In the year 1837, the great inconvenience attending this state of things was brought under the consideration of the town-council, by whom a committee was appointed to meet the Commissioners, with a view to a consolidation of the Acts, the introduction of several amendments suited to the present state of the borough, and one uniform system; but the Commissioners of the various Boards declined co-operation with the council: and thus the matter rested until the year 1840, when another committee was appointed for the same object, but having ultimately in view an application to Parliament by the council leaving the several Commissioners to oppose it upon any grounds they might consider tenable. This proceeding terminated in consequence of a difficulty which arose as to whether the expense attending the application to Parliament (in the event of a failure from any circumstance) could be paid out of the borough fund without violating the Municipal Act. The opinion of Mr. J. Wightman (then at the bar) was taken on the point, who considered that the borough fund could not be charged



with the expense, and the application was therefore abandoned ; and thus the matter has remained from that period to the present. My official situation enables me to speak to the great difficulties and inconvenience experienced by the borough magistrates in administering justice within their jurisdiction under the existing Acts, and as to the necessity of additional powers, similar to those given to the magistrates, at the police offices in London, under the 2 and 3 Victoria, c. 47.

“ I remain, Sir,

“ Yours, very obediently,

“ P. GEORGE, *Town Clerk.*”

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With respect to the service of scavengers, Mr. George observes :—

15. “ The annual expense cannot be ascertained, it being borne by ground-landlords or tenants, and not by any public body.”

16. “ They (the courts and alleys) are cleansed by the scavengers appointed under the local Acts. The refuse is removed by carts twice a-week, at the expense of the rates.”

17. “ Dust-boxes are used ; the refuse is removed twice a-week.”

18. “ The scavenger has a depôt in the environs,—the refuse carried into the country and sold for manure.”

19. “ There are three local Acts, which are conflicting and inadequate in their powers,—many nuisances not punishable, and those that are, varying as to penalty and punishment.”

A remarkable instance of the effects of apparently conflicting views is to be seen in York-street, near the abbey, one-half of it being (longitudinally) paved, the other half macadamized ; so that (the street not being a wide one) the wheels on one side of a carriage may run on a paved, those on the other upon a stoned road.

Though some of the courts and alleys were found dirty and ill-cleansed, and cabbage leaves, peas-cods, and other refuse of that kind may be thrown into them, and into such streets as Avon and Milk-streets, inhabited by the poorer classes, the scavengers' work may be regarded as fairly executed at Bath, more particularly when compared with that in the generality of towns of a similar population.

*Streets, Alleys, and Courts.*—Bath may be regarded, taken as a whole, as a well-built town ; the streets generally airy and good, the chief exceptions being in the lower and older part of the town. Courts and narrow alleys are not very frequent. Milk and Avon streets, the abode of the poorest classes, are both fairly wide streets ; the houses in them are usually dirty and ill-ventilated, but the streets themselves would be regarded, in towns where good streets are not so prevalent, as sufficiently wide, and they are both well paved. A main sewer is stated to run between the two streets, and to be swept clean daily by the discharged water from the hot-baths. The courts behind are in many instances dirty and ill-cleansed.

Selden-court in Southgate-street is narrow (about four feet wide) and dark, having a wall in front of the houses nearly equal in height with them ; it is represented as not healthy, but it appears well drained and clean. The great evils are bad ventilation and want of light. There seems no regulations for the construction of such courts, for Boyce's-court, in Wine-street, recently built, is very narrow and ill-ventilated, but it is clean. There are some miserable dwellings in Barton-place,

and other situations inhabited by the poor ; but the evil in modern times has been the erection of houses in the Dolmeads, previously mentioned as liable to floods. These are inhabited by the poorer classes, and the drainage among them is imperfect, though some sewers have been constructed at the cost of the owners. No precaution has been taken to prevent the water in times of flood from entering these drains, and they therefore rather aid the inundation of the houses in this district, which is otherwise partially protected by an embankment. The high-ways also among them are in a bad state, especially in the Ferry-road, though a way-rate of 9*d.* in the pound is levied upon the occupiers.

The ventilation of the poorer houses is usually bad and neglected, and there is much personal dirt. There are no cellar dwellings. The school-rooms for the labouring classes are not ill constructed, but they appear to have no play-grounds. Mr. Philip Duncan describes their site, drainage, light, warmth, and ventilation, as "sufficiently good ;" and Mr. George also expresses himself favourably on this head.

Mr. George states that there are no local Acts or provision to prevent the ends of the streets being closed up, or to relieve over-crowding by promoting the extension of suburbs.

Respecting the habitations of the poor, Mr. Philip Duncan observes :—

50. "Many are crowded and dirty."

51. "In the worst houses twelve families, frequently four persons in a room."

52. "The general state of the air (in the dwellings of the poorer classes) very impure."

53. "Better warmed than in most towns, as coal is comparatively cheap, and coke is much used by the poor."

*Lodging-houses.*—According to a return from the police, there are about 27 houses of this kind in Bath, chiefly in the lower parts of the town, and the general character of the keepers of them is represented by the same authority to be bad. The probable number of vagrants who sleep in each house each night is stated by the police to vary from four to six, so that, taking the number at five, 135 persons of this description would, on the average, sleep in these lodging-houses per night. Supposing that, on the average, each vagrant may sleep two nights in these houses, 19,870, or nearly 20,000, would be the number of different vagrants sleeping in the Bath lodging-houses per annum. Making every allowance for the same parties visiting Bath more than once during the year, yet considering that many only remain one night, the number of different vagrants who visit this city must be very considerable. By those who have looked into the subject, it is stated, that during the season at Bath, when there is a considerable influx of visitors, the vagrants are most numerous, and it is to be feared that indiscriminate charity somewhat prevails at this place. A large proportion of these vagrants is represented to be of the worst kind. They pay about 3*d.* per night for their beds, placed in small, ill-ventilated rooms. The beds are usually occupied by two, but occasionally a larger number is crammed into them, without much regard to sex or age. For the relief of deserving poor travellers, there is a Refuge for the Destitute, where they are provided with food and beds for the night ; after which, if found begging, the police interfere.



Also, to relieve deserving poor travellers, a gentleman of the Committee of the Society for the Relief of the Sick Poor, usually termed the Monmouth-street Society, from meeting at their house in Monmouth-street, attends daily (Sundays excepted) to hear the applications of poor travellers. He gives them (if considered deserving) a loaf of bread and some soup, under promise to leave the town.

*Public Parks and Walks.*—The chief of these is a space of about 200 acres, named Victoria Park, which was formed by subscription in 1829, and is now supported in the same manner. The corporation gave 100*l.*, and 100*l.* annually, and in a few months nearly 4000*l.* were raised. This park partly occupies the common fields belonging to the freemen of Bath. The Victoria Park is under the management of a committee, and the public have access to it.

In addition to this is the East Park, and Cleveland-walk, due to the exertions and liberality of the public authorities, the agents of the Duke of Cleveland (a large proprietor at Bath), and others.

*Baths.*—This city has long been famous for its thermal springs, as its ancient and modern names attest. From the remains of large baths and sudatories that have been discovered, the Romans appear to have made that use of them that might have been expected. These baths would appear to have been destroyed at the time of the Saxon occupation of the country, and one locality at least made a burying-place, connected with an abbey or priory, as Saxon stone-coffins were found, in 1755, above these remains, which were then first discovered, one coffin resting upon one of the pilasters of the great bath. The rubbish being cleared away, and several ancient channels for carrying off the water repaired, the locality again became one of baths and sudatories, under the name of the Kingston Baths, from the duke of the same name, who rebuilt them.

Roman remains have been found in connexion with the other baths; among these was part of a Roman bath, the steps to which had been apparently much worn by the feet of the bathers.

The baths consist of the King's and Queen's Baths, the Royal Private Bath, the Cross Bath, the Tepid Swimming Bath, and the Kingston Baths.

The King's Bath is 66 feet long and 41 feet wide; is filled daily to about the height of 4 feet 7 inches, and contains about 314 tons of water. The spring in the centre of the bath affords three hogsheads of water per minute, at a temperature of 116°.

The Queen's adjoins the King's Bath, and is smaller, being about 25 feet square, and is supplied from the same spring.

Connected with the King's Bath is a reservoir for cooling the waters, containing about 32,000 gallons, so that the private baths may be arranged at convenient temperatures. A jet into the air, worked by a small steam-engine, performs the cooling process in the centre of the reservoir.

At the King's and Queen's Baths the charge for bathers is 1*s.*, and they appear to have been far more frequently used formerly than at present; parties of ladies and gentlemen then bathing together, properly dressed. There are seats and recesses round the King's Bath for the accommodation of the bathers, who may select a temperature in different parts of the bath, varying from 100° to 116°.

At the Cross Bath, so called from a cross formerly in the centre of it, erected as a memorial of the Queen bathing in it in 1687, persons can bathe on payment of 6*d.*, in order to meet the means of the less affluent classes. The old charge was 1*s.* 6*d.* The number of persons who bathe—and the terms have not been long reduced—is estimated at 3500 per annum, and they are considered to be on the increase. The temperature of the water is 94°, and the waste water, giving nearly the amount of that rising from the spring, is about 18 gallons per minute.

At the Royal Private Baths there are seven baths, fitted with marble and glazed white tiles. Each bath contains about 14 hogsheads of water, which flows into it in about five minutes.

Attached to these baths is one for invalids, named the Hospital Bath, the temperature of which ranges from 98° to 100°. Here poor persons bathe under regulations. Orders by the mayor remain in force for a month; and when a surgeon certifies that benefit may arise, the bathing appears to be gratuitous.

The Bath Hospital, open to the sick poor of Great Britain and Ireland, and now including the poor of Bath, which at its foundation it did not, as it was supposed that they could have the benefit of the waters at small cost, was opened in 1742. Upon the case of a patient being described by some physician or properly skilled person of the neighbourhood where the patient resides, and it appearing a proper one, he receives a notice when a vacancy takes place. The patient is expected to deposit 5*l.* caution-money before admission; for soldiers it is 3*l.*; the caution-money being “to defray the expenses of returning the patients after they are discharged from the hospital, or of their burial, in case they should die there. The remainder of the caution-money, after these expenses are defrayed, is returned to the person who deposited it.”

The Bath waters probably find their way through one of those fissures or dislocations common in the older rocks of the same district, termed *faults*; in this case, not improbably through the Coal Measures, continued beneath the sandstones and marls, named the New Red Sandstones and Marls, and their covering of lias and other members of the oolitic series, from adjacent rocks of the same kind. At Bath, the thermal waters have forced their way through superincumbent red sandstones, marls, and lias. It has been suggested that a large amount of these waters which now run to waste, or is let out from the baths, might usefully be collected in a large tank or reservoir for public bathing at a very small charge.

*Supply of Water.*—This, for domestic purposes, is obtained from springs thrown out by the clay, or other impervious beds in the series of rocks of which the neighbouring hills are composed, collected and conducted into the town, or from wells sunk in different places.

Mr. Little, agent for the Circus Water Company, enumerates the following water companies at Bath:—

Circus Water Company.  
 Captain Dunning's Water Company.  
 Park-street Water Company.  
 Sir Thomas Bloomfield's Water Company.



Cavendish-square Water Company.  
 Lord W. Paulet's Water Company.  
 Lord Manvers' Water Company.  
 Corporation Water Supply.

"Several of these companies," it is stated, "supply a very limited number of houses, and are confined to the boundaries of the properties on which the spring, supplying the water, has its rise, and as none of them are protected by Act of Parliament, they are not able to extend their pipes into any neighbouring district, and thereby create a competition."

Mr. Little states that there is a great waste of the surplus Circus water, sufficient to supply Avon and Milk streets (inhabited by so many poor families) for seven months in the year, and that if the corporation would lay down pipes, the water might be supplied without further expense. In his answers to those questions of the Commissioners, which relate to water, he says:—

26. (The town is supplied) "principally by several private companies and by wells. All the companies have not fire-plugs nor could they render assistance in case of fire."

28. (The mode in use for distributing the water is) "by means of iron and lead pipes under the roads and pavement."

31. "Most of the houses have water laid on, except the very poorest class, and have separate tanks for about 40 to 60 gallons."

32. "I know of but three stand-pipes for the poor of the whole city, and that only for certain hours in the morning. The others (of the poorer classes) get their supply as they can."

33. "I know of none." (Complaints respecting supply.)

34. (The annual charge is) "about 20s. for the poorest, 40 to 50 gallons per diem, and higher according to the quantity supplied."

35. "About 40 gallons a-day for 20s., 60 gallons for 30s., &c."

36. (Respecting redress for deficiency in quality or quantity.) "None that I know of."

38. (As to the use of filters, in private houses.) "I think not; nor do I deem it requisite, from the pure state of the water."

39. (Respecting the water being kept on night and day.) "Only at certain hours of the day. Except the corporation new fire main, which is always charged, but at present only laid in a few streets"

41. "The corporation new fire main can throw the water over high houses and buildings."

42. (With respect to time of full supply of water in cases of fire.) "It depends on the part of the town in which the fire may arise, but in no case, I think, more than about 15 or 20 minutes."

43. "There are no arrangements (against fire) beyond the supplies to be obtained from the pipes."

44. (Average number of fires in the year.) "I think not one serious fire in a year. There are many small accidents, but generally put out by the police, who are furnished with leather buckets by several offices."

46. "There are men and engines practised about four times a year."

The following respecting the supply of water are among the answers received from the town-clerk:—

26. "From springs which flow from the surrounding hills collected into reservoirs, applicable for domestic use and the extinction of fire."

27. "The water is very pure, but not generally soft, being loaded with carbonate of lime. Know of no analysis having been made, or any evil arising from its use."

28. "By iron pipes chiefly, to which are united lead feathers for conducting the supply into cisterns."

29. "By the corporation principally, water companies, and private individuals."

30. (Number of houses in the town.) "8200."

31. "About 3000 houses are supplied from the corporation water-works, each having a separate cistern or cisterns, except in small courts, where there is one common cistern."

32. "The corporation gratuitously supply six public conduits in poor districts, from which water can be drawn five hours per day. In some situations, without the water-works, wells are sunk upon the premises; but generally the city and suburbs are sufficiently supplied."

33. (Respecting complaints.) "So few as not to be worth naming, good water being one of the best and cheapest articles Bath can boast of."

34. (Annual charge of water laid on.) "Varying from 10s. to 2l. 10s. per house. Average 27s. each."

35. "The size of the cistern regulates the charge: the lowest sum entitles the recipient to 40 gallons per day, the highest two hogsheads."

36. (Redress for deficient supply.) "None; the consumer being content to take such supply as the springs afford, and new applicants do not require a guarantee which cannot be given."

37. "The quality appears unchangeable. The quantity must depend on the fall of moisture."

38. (Filters.) "They are considered unnecessary, from the supply being so pure."

39. (Water kept on.) "From six to 12 hours per day, according to the quantity in the reservoirs."

40. (Stand-pipes for cleansing pavements.) "None."

41. "By a new arrangement of the pipes, there is laid down in the central parts of the city what is termed a 'fire-main,' belonging to the corporation water-works, which is kept constantly charged, and from which, by means of a leathern hose attached to the fire-cocks, in five minutes a continuous stream of water can be thrown on a conflagration to the height of 103 feet, simply by the column or pressure which the elevation of the reservoir gives. This self-acting principle is now being extended to other districts, and will in future be adopted where new pipes are necessary."

43. (Arrangements for protecting public buildings from fire.) "None, except the provision contained in the preceding answer, or private fire-engines."

44. "Bath is singularly fortunate in being comparatively exempt from such calamities, no fire of consequence having occurred for some years. Many individual losses no doubt happen, but only known to the agents of fire-offices. This, in some measure, may be attributed to the stability of the buildings, which are nearly all built with freestone, protected by party-walls."

46. (Well-appointed and practised engines and service of firemen.) "Yes."

Mr. Bristow, F.G.S., of the Ordnance Geological Survey, reports, from a levelling which he made, that at the principal reservoir, No. 4, at Beechen Cliff, belonging to the corporation, the spring is 157½ feet above the ordinary height of the Avon at the Old Bridge. The front of the reservoir B.C.W.W., where the clay is one foot from the surface, nearly 147 feet. This reservoir is filled from that above, and is driven back four feet. The height of the ground in front of the next reservoir is 124 feet. There are other reservoirs on the hill, but the chief one is No. 4. Pipes convey the water from these reservoirs into the town.



The wells vary in the quality of the waters raised from them, according to the beds of limestone, clays, marls, sands, &c., in which they are sunk.

In the alluvial ground, Mr. Bristow states, that trees (oaks, &c.) are sometimes found in great abundance beneath an alluvial red loam, about eight feet thick, resting on gravel of about the same thickness, and this upon lias clay. The water, though in abundance, is never good where these trees are found; they are often so soft as to be cut by the spade. Beneath the gravel there is generally a copious supply of water, but it is rarely good. In the sinkings into the lias clay, some furnish tolerable water;\* but other wells have been carried down many feet without obtaining it.†

The following section of a well at Prior Park shows the water retained by clay beneath the great oolite limestone:—

	Feet.	
Loose rock . . . . .	20	} Great oolite.
Oolite . . . . .	20	
Hard freestone . . . . .	20	
Clay (Fullers'-earth) . . . . .	40	
<hr/>		
Water . . . . .	100	
<hr/>		

The next gives an example of water sustained by the clay beneath the Inferior Oolite Sand, at America Buildings, half way between the river and the top of Lansdown:—

	Feet.
Light clay . . . . .	20
Oolite . . . . .	30
Sand . . . . .	100
Blue clay . . . . .	24
<hr/>	
Water . . . . .	174
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These examples will suffice to show the manner in which the water is retained among the various beds by the clays, which when they crop out on the sides of the hills produce springs.

\* Mr. Bristow notices one well of which the following is a section:—

Loam . . . . .	4 feet.
Lias { Gray clay . . . . .	6 "
Blue clay . . . . .	90 "

The water rose nearly to the top of the well.

On the Widecomb-road:—

Red loam . . . . .	3 feet.
Blue clay . . . . .	77 "

Water very good and abundant.

† At Holloway Brewery, 70 feet above the level at the Old-bridge, the following well section was found:—

Rotten sand . . . . .	30 feet.
Blue clay, with occasional bands of lias limestone, about 4 feet apart . . . . .	200 feet.

Well abandoned from want of water.

There are several other examples of dry wells in the lias.

*Health and average Age of Inhabitants.*—Properly to estimate the health and average age of the inhabitants of Bath, it should be borne in mind that it is a place of much resort for persons in affluent and easy conditions of life, (among whom females prevail,) who reside in good houses, and for the most part in well-ventilated streets, or crescents and ranges of building well exposed to the sun and winds, especially to the mild and prevalent southerly and westerly breezes.

Not only is this prevalence of females due to those in easy circumstances, who make Bath their residence, but to the number of maid-servants employed in the different families. On examination of the population returns since 1801, it would appear that, in 1801, the proportion of females to males was as 1·5 to 1, or 30 to 20; in 1811 the same; in 1821 as 1·4 to 1, or 28 to 20; in 1831 the same; and in 1841, 1·38 to 1, or about 27 to 20, showing a decrease in the difference for every 20 years since 1801. In 1801 there was an excess of 6777 females; in 1811 one of 8326; in 1821 one of 7874; in 1831 one of 8730; and in 1841 one of 8546.

When it is considered that out of the population of 53,206, as appears by the return for 1841, 30,871 were females, of whom a large proportion were not born at Bath, but came to reside in this city, many in advanced life, and many in its prime, particularly the maid-servants; that considerable numbers of the males have also become residents at mature age; and that so large a proportion of the population is among the easy classes, well lodged and fed, receiving every attention in sickness, their servants also for the most part withdrawn from many of the causes of disease to which the poorer classes are usually exposed, we shall not be surprised at the character for health which this town enjoys.

It being very desirable to obtain the opinion of a properly qualified medical man on the health of the Bath population, Mr. Field, a skilful practitioner and registrar for the Lansdown district, was requested to investigate the registers for the year ending July, 1843; this he kindly undertook to do, and the following is his report:—

*Report by Mr. Frederick Field, Surgeon, &c.*

“The city and borough of Bath, by the census of 1841, contained a population of 53,206. The number of deaths registered during the year ending June 30th, 1843, is 1151, of which 565 were males and 586 females.

“Assuming that there has been but a slight increase of the population since the time of the census, we will take the numbers as we there find them, which will give a ratio of a little more than 2·1 per cent. as the mortality for the year terminating June 30th, 1843.

“Of this mortality rather more than three-tenths (351) are of children under 5 years, an equal proportion (353) between 20 and 60, three-tenths (348) above 60, and the remainder (99) between 5 and 20.

“Fever is not a common malady in Bath; the total number of deaths from that cause is but 42; and here it must be understood, that under the term ‘fever,’ I have included *every* death belonging to the class, whether registered as typhus, bilious, nervous, &c.

“Contagious maladies were not so prevalent in the year to which our remarks are confined. The total number of deaths from them is 41, viz., 3 by small-pox, 3 whooping-cough, 9 scarlet fever, and 26 from measles.

“Humanity must congratulate itself on the fact that only 3 deaths from small-pox occurred in so large a population during a twelvemonth. The Vaccination Act has been rather actively carried out in the city and neigh-



bourhood, as I find that the sum of 171*l.* 4*s.* 6*d.* has been paid to the district vaccinators by the Board of Guardians since the spring of 1842.

“ The proportion of mortality above 60 to the whole is large. It has been often said, and I believe with truth, that the city of Bath contains a larger number of *aged* persons than any other place in the kingdom of equal size and population.

“ The deaths from consumption and decline are 185, forming nearly a sixth of the total mortality. I find 2 deaths of policemen registered, and both of them were from consumption. The average number of that force is 97, and 2 deaths in a year warrant the idea that there is nothing very destructive in the atmosphere of Bath to those who are so much exposed to it.

“ Why so large a number of children under 5 years die in Bath (three-fifths of the number being under one year) is a question not very easy to answer. Let us take a slight review of each of the registration districts, and we may then, perhaps, be enabled to come to some conclusion.

“ The Lansdown district comprises the western part of the parish of Walcot. It is bounded on the south by the river Avon, on the north by the Lansdown Hills, on the west it is open to the surrounding country, and on the east it adjoins the Walcot and Abbey districts. Part of it lies low, but fully two-thirds are upon elevated ground, and inhabited principally by the upper ranks. The lowest parts are liable occasionally to be extensively flooded; and the sewers being but a small height above the mean level of the river, it frequently passes into them, thereby impeding the drainage.

“ The total ratio of mortality for the district is 1 in 47·5: taking a section of the part which lies low, and inhabited chiefly by poor people and vagrants (Avon-street and Milk-street), we find the ratio to be 1 in 40·3; on comparing this with another section, of an elevated situation, and inhabited almost entirely by the rich (the Crescent, Circus, &c.), we are struck by the great difference, the ratio there being 1 in 76. We must not, however, from this conclude that mere *locality* is the cause of this, for, taking another section, of equal elevation, but inhabited in a great measure by *poor* people (Lampard’s-buildings, Balance-street, &c.), we find the ratio 1 in 36·7. Now it is precisely in these parts that the infantile mortality is so great, constituting *one-half* of the total deaths, whilst in the richer part it is only a little more than *one-eighth*.

“ The greatest number of deaths under 5 appear to be caused by convulsions, pneumonia, and bronchitis, tabes mesenterica, measles, scarlet fever, and diarrhœa.

“ The number of deaths from consumption is about the general ratio for the city as before mentioned.

“ The Walcot district comprises the eastern portion of the parish of Walcot. Nearly the same remarks may be made with respect to it as of the adjoining district of Lansdown; a considerable part of it is bounded by the river, to which many of the houses are nigh. Some of these are inhabited by the poor, and are liable to be flooded. The ratio of mortality is 1 in 48·5; the mortality under 5 rather higher than that of Lansdown. Weakness, bowel complaint, atrophy, measles, and inflammatory affections of the chest, are the principal causes of infantile death. I have not the data in my possession for computing the ratio of mortality in different sections of this district, as in the case of Lansdown; but on looking over the Returns, there appear to be some places which have a greater proportionate mortality than other parts, viz., Ainslie’s-buildings, Wellington-place, and Half-moon-street. They are all situated at some distance from the river (the two former in an elevated position), and inhabited by workpeople and paupers. The deaths from consumption are above the mean ratio of the city.

“ The Abbey district comprises the parishes of Saint Michael, Saint Peter and Paul, and Saint James. On the south and east it is bounded by the

river, and in other directions by the Lansdown and Walcot districts. Part of the parish of St. James lies very low, and is at times most extensively flooded. The drainage here is defective, owing to the same cause as already mentioned with respect to the lower part of the Lansdown district.

“Part of the parish of Saint Michael lies rather low, and is occasionally flooded, though not to so great an extent as that of Saint James. A considerable portion of the Abbey district is inhabited by the principal tradesmen of the city, who live in spacious streets, and occupy well-ventilated dwellings. In estimating its mortality, we must deduct 200 from its population, being the average number of patients in two hospitals, including servants. This will make its general ratio 1 in 51·3. The mortality under 5 is higher than the Walcot district, and appears principally to be caused by convulsions and debility. The deaths from consumption are about the general average. Walcot-street, Trim-street, Gallaway-buildings, Chapel-court, and Saint James’s-parade, appear to have a large ratio of mortality. In the first two and in the last there are several poor inhabitants. The third and fourth are occupied almost entirely by the poor. The dwellings are very crowded with inmates.

“The Bath United Hospital, for the reception of medical and surgical cases, is also situated in this district. Its average number of inmates is 65, and it generally receives 1000 in-patients per annum. The number of deaths that occurred in it is 56 ; three only of them were cases of fever.

“The Lyncombe and Widcombe district comprises the parish of Lyncombe and Widcombe. It is situated on the south side of the river Avon, and has a large poor population, inhabiting houses close to its banks, and liable to be greatly inundated at times. On the slopes and tops of the hills, however, are dwellings occupied by the higher ranks. If we deduct from the population the inmates of the workhouse (about 540 at the time of the census), the ratio of its mortality will be 1 in 57·5. Its infantile mortality is enormous, being 72 or nearly one-half, and of these 72, fifty are under one year. The causes of death under five appear to be convulsions, *asphyxia*, bowel complaint, consumption, and inflammation of the chest. The age of the asphyxiated children is described as a *few seconds*! This is a fact which certainly demands particular investigation. The ratio of deaths of aged people is very little more than one-sixth of the total mortality. The deaths by consumption are above the average. The Dolmeads we should expect to exhibit a high rate of mortality, but such is not the case; and the houses in the vicinity of the canal-basins, and of a large mill-pond, do not present a higher rate of mortality amongst their occupiers than the other parts of the district.

“The workhouse is situated on Odd Down in this district. Its average number of inmates is about 600. Five of the 85 deaths registered are from measles, and one only from fever. On inspecting the causes of death, there is nothing to warrant the idea of its being otherwise than a healthy place. I have been in doubt whether some of the workhouse deaths should not be added to the general mortality of Lyncombe and Widcombe. If so, they should be part of the aged and the children, the former in all probability having lived for some time within its walls, and most of the latter having been born and bred up in it. This determination, however, would not make much difference in the ratio under five.

“The parish of Bathwick forms a part of the Bathwick district. It is mostly inhabited by the higher ranks of the community, who live in airy and elevated positions. Only a small part, near the river, is occupied by the poor, and here they suffer occasionally from floods. The ratio of mortality is 1 in 61·4. The mortality under 5 is very small (not one-fourth). The deaths from consumption much less than the average (one-ninth).

“From a careful review of the facts brought under my notice during this analysis of the Mortality Returns, and from an experience of more than 20



years as a medical practitioner in this city, added to the information I have acquired from my professional friends, I cannot but conclude that Bath is a healthy place. The returns of deaths above 60 show that a great number attain to advanced age. The deaths from consumption are not more than the general ratio of the kingdom; and those from fever are very small. Indeed, when we consider that a great number of the higher ranks are its inhabitants, who live in large handsome houses, well ventilated, and many of which may be called *rural residences* with strict propriety, we could not look for any other than a healthy state of population.

“On the other hand, we must take into account that a considerable amount of poor dwell in the city, and that a large number of vagrants are constantly resorting to it for the sole purpose of begging, and therefore we ought not to be surprised if its mortality were higher than it is. I have carefully examined the Returns to see if there were any *particular* place that I could mark as having something within it more productive of disease than the adjoining neighbourhood. James-street, in the Lansdown district, and Oak-street, in the Lyncombe and Widcombe districts, are both places lying low and liable to suffer from floods. The former gives 10 deaths, four of which are from consumption and two from pneumonia. The latter gives six deaths, four from consumption and two from pneumonia. The elevated situation in the Lansdown district (Lampard’s buildings, &c.) gives a greater ratio of mortality than Avon-street and Milk-street, though the latter places lie very low, and the greater part of the vagrants take up their abode in Avon-street and its courts.

“Wellington-place, in the Walcot district, gives a large mortality (11), of which seven are children under 5, three persons between 20 and 60, and one only above 60. Is it because these places are situated on the *slope* of a hill that their mortality is excessive? I have mentioned these few instances to give an idea of the difficulty of coming to a conclusion, especially when it is considered that I have only the returns of a year to draw my inferences from.

“The mortality under 5 is large. It is in poor districts that we find it to be the case. Be it remembered, however, that these districts contain a larger number of young children than their *richer* neighbours. Still, making this allowance, there should not be such an excessive disproportion. It occurs in *all* localities, whether situated high or low. Must we look to the moral condition of the poor to explain it? They certainly exhibit great carelessness with regard to the preservation of the health of their children, and too often neglect to avail themselves of medical assistance until too late to be of service.

“There are many *physical* causes of disease in Bath. Witness the floods in the lower parts, their imperfect drainage, and the crowded and dirty state of the dwellings of the poor in various localities; and disease there would be of great extent and fatal character, were it not for the very active benevolence exercised towards the poor, and the great facility they have in obtaining medical aid from the hospitals and dispensaries with which the city abounds.”

TABLE I.—GENERAL MORTALITY.

District.	Population by Census 1841.	Deaths.	Males.	Females.	Under 5 Years.	Of whom under 1 Year.	5 Years and under 20 Years.	20 Years and under 60 Years.	60 Years and upwards.	By Consumption and Decline.	By Fever.
Lansdown . . . .	14,111	297	136	161	88	47	19	91	99	47	8
Walcot . . . . .	12,102	250	112	138	80	45	21	74	75	49	7
Abbey . . . . .	12,103	216	121	95	75	48	23	57	61	35	8
General Hospital . .	..	3	2	1	..	..	..	1	2	..	..
United Hospital . .	..	56	36	20	1	..	16	36	3	5	3
Lyncombe and Wid- combe . . . . .	9,920	163	87	76	72	50	12	51	28	33	11
Workhouse . . . .	..	85	42	43	15	2	3	26	41	7	1
Bathwick . . . . .	4,973	81	29	52	20	10	5	17	39	9	4
Total . . . . .	53,209	1,151	565	586	351	202	99	353	348	185	42

The following Table has been constructed from the documents furnished by Mr. Field.

TABLE II.—EXTRACTS from the REGISTRIES of DEATH for the Bath Registration District for the Year ending July, 1843.

Occupations.	Total Number of Deaths.	Average Age at Death.		Number of Deaths from Con- sumption.	Number of Deaths from Epidemic, &c., Diseases.	
		Above 5 Years.	At all Ages.		Under 5 Years.	All Ages.
		Yrs. Mths.	Yrs. Mths.			
Gentry, &c. . . .	119	63 1	59 5	11	1	8
Tradesmen, &c.. .	244	47 7	32 5	37	22	33
Artisans, Labourers, &c.	462	44 8	31 0	89	25	43
Undescribed, &c. .	231	48 9	29 0	21	13	20
Paupers . . . . .	100	60 8	54 0	7	8	15
Totals . . . . .	1,156	50 2	35 3	165	69	119

From this it appears that while the average age at death of the gentry for this year was 59 years 5 months, that of the tradesmen was 32 years 5 months, and of the artisans, labourers, &c., 31 years, the average age of the tradesmen being nearly one-and-a-half years above the latter, while it is 27 years under the average of the gentry; a difference somewhat remarkable, when the commodious size of many of the shops is considered, and that many persons of this class at Bath are in very easy circumstances. When the deaths under five years are deducted, the difference in the average age of the gentry and tradespeople is not so considerable, being  $15\frac{1}{2}$  years, and that between the latter and the artisans, &c., is increased, being 2 years 11 months, which would make it appear that while the average age of the gentry is reduced, by addition of the deaths at 5 years and under, only  $3\frac{2}{3}$



years, either from the comparative small number of such deaths among them, or the great proportion of adults to children in this class at Bath, the average age of the tradespeople is, by this addition, reduced  $15\frac{1}{6}$  years, and that of the artisans and labourers  $13\frac{2}{3}$  years.

From Table I. it appears that one in 3·3 of the total deaths for the year were under 5 years, and Mr. Field remarks that this is chiefly among the poor; at the same time, however, it would appear to be much felt among the tradespeople, judging from the difference in the average age of this class, caused by adding or subtracting the deaths at 5 years and under. The number of deaths at advanced life, 60 years and upwards, is considerable for the year, being no less than 1 in 3·3, the same as for the children under 5 years. That of those from 20 to 60 years does not much differ from this, being 1 in 3·26, leaving the number who die from 5 to 20 years 1 in 11·6.

When the births are compared with the deaths at Bath, and every allowance made for the imperfect registration of the former, it appears that there must have been a considerable influx of strangers to account for the increase in the population of Bath, of about 20,000, between 1801 and 1841, or at a rate of about 500 per annum. The total births compared with the total deaths for the last 5 years only give a preponderance of births over the deaths of 1046, leaving a population of about 1500 to be accounted for during that time by immigration. In 1840 the births were not equal to the deaths, according to the registration, by 75. Taking these 5 years to guide us, there would therefore appear an increase by immigration into Bath of about 300 persons per annum, or three-fifths of the total annual increase; and it is well known that such persons are chiefly of the more wealthy and easy classes, and not unfrequently of advanced age, giving by their deaths a somewhat fallacious character to the high average age for the town, and more especially for the gentry inhabiting it.

TABLE III.—NUMBER of BIRTHS and DEATHS registered in each of the Sub Districts of BATH, in the Years 1839 to 1843, ending the 31st December.\*

	Births.	Deaths.
Abbey . . . . .	1558	1742
Batheaston . . . . .	1023	771
Bathwick . . . . .	681	651
Lansdown . . . . .	1673	1639
Lyncombe, &c. . . . .	1588	1550
Twerton . . . . .	1259	677
Walcot . . . . .	1784	1490
Total . . . . .	9566	8520

These tables would give a somewhat high rate of mortality for Bath during the 5 years, taking the population at 53,206, the census of 1841, as well for the two preceding as for the two succeeding years, and, therefore, as a fair average, and deducting the deaths for Bath-easton and Twerton.

\* Obtained from the Office of the Registrar-General.

*Per Centage of Deaths at Bath.*

1839	1840	1841	1842	1843	Mean = 2.64
—	—	—	—	—	
2.5	3.0	2.7	2.6	2.4	

This mean is beyond the average for many large places and for the country at large, and when we regard the high average age at death for Bath, is one well illustrating how far the disturbing causes of a considerable immigration of persons advanced in life, and of many deaths among them,—it has been seen that 1 in 3.3 of the total deaths for 1843 was of 60 years and upwards,—may give a fallacious character to the results obtained for longevity or per centage of deaths in a particular locality.\*

Referring to Table II., 1 in 10.8 were from consumption among the total deaths of the gentry, 1 in 6.6 among the tradespeople, and 1 in 5.2 among the artisans, &c., showing that the last class suffered most from this disease, which, as a whole, caused 1 in 7 of the total deaths for the year; no great proportion when compared with the towns mentioned in the Swansea Report.

The same table shows that 1 in 14.9 died among the gentry from epidemics; 1 in 7.4 among the tradespeople, and 1 in 10.7 among the artisans and labourers, showing, for the year 1843 at least, less mortality from epidemics among the latter than among the tradespeople. Taken as a whole, only 1 in 9.7 of the total deaths for this year were from epidemics; but of this number somewhat more than one-half were children under 5 years of age.

A large number of the deaths for the year, 1 in 5, being undescribed as regards class, the average age of these persons being 29, all ages included, and 48 $\frac{3}{4}$  years, excluding those under 5 years, and the investigation being only for one year, these conclusions respecting the average age of the different classes can be only regarded as approximations.†

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\* The difference between the rate of mortality above given for 1843, and as stated by Mr. Field, arises from the different number of deaths in the returns furnished to him, from that given in the preceding table, the same amount of population being taken for both calculations, and appearing to show that the area termed Bath in both accounts was not the same. There is occasionally much difficulty in ascertaining how far the population, as given in the census, may truly correspond with that to which the mortuary registers have reference. The mean rate of mortality for Bath, as given in the quarterly table of mortality for June 1843, issued under the direction of the Registrar-General, was 2.6, agreeing with that above stated.

† Though these numbers do not precisely agree with those obtained for the deaths at Bath in 1840 (Chadwick's Sanatory Report, 1842, p. 168), they approximate sufficiently to them to show the general difference in the average ages of the different classes at death. Mr. Elwin states that out of 616 cases of death in 1840, the results were as follows:—

No. of Deaths.	Average Age at Death.
146 gentlemen, professional persons, and their families . . . . .	55 years.
244 tradesmen and their families . . . . .	37 „
896 mechanics, labourers, and their families . . . . .	25 „

Mr. Elwin adds, “In making these returns, I have thrown out all visitors and occasional residents; and my knowledge of the locality, with the assistance of the clerk of the Union, has enabled me to attain complete accuracy with respect to the gentry, and a close approximation to it in the remaining cases.”



## REPORT on the SANATORY CONDITION of FROME, SOMERSET.

BY SIR HENRY T. DE LA BECHE.

*Situation.*—The town is situated on the upper part and north-eastern and eastern sides of a hill rising about 180 feet above the river Frome, a comparatively small portion only occupying the lower ground near the river, or rising on the opposite side of the valley. The mills or manufactories, chiefly of woollen cloths, are placed at convenient intervals for their purposes, for about three miles in length along the river. The county is hilly, and raised, as a whole, considerably above the sea.

*Climate.*—It does not appear that any correct register of temperature, or of the frequency and amount of rain, has been kept. The higher parts of the town are well exposed to the winds, but the slope facing the east is not so well swept by them, being sheltered from the most prevalent, the west and south-west, while it is open to the northern and eastern. As to the frequency and amount of rain, the climate does not appear to differ much from that of Bath and Bristol; but in regard to temperature, from its greater height above the sea, and from its general want of shelter from the northward and eastward, Frome possesses a climate, as a whole, colder than in those two neighbouring cities.

*Geological Character of the Ground on which the Town is built.*—Frome stands on portions of the series of rocks which is termed oolitic, from the frequent occurrence of oviform grains in the limestones, which, with clays, sands, and sandstones, compose this series. The chief part of the town is built on the shelly oolitic limestones, intermingled with clays, termed Forest Marble, reposing on the clay and shales known as Fullers'-earth, from a portion of good fullers'-earth (employed as such for the cloth manufactories) being obtained from it in the extension of the same rocks nearer Bath.

From the intermixture of clays with the shelly limestone beds, from partings, and a structure, generally porous, of the latter, conditions for springs and obtaining water from wells are frequent. A part of the ground at Keyford (a portion of the town so named) has a sandy foundation, from the occurrence of sands and sandstones in the upper part of the forest marble. This portion of the town is necessarily based on the driest rock; the limestones afford the next best foundation; while the clays, whether found among the limestones, or at the lower part of the town, where the fullers'-earth appears, prevent the free absorption of water, keeping the surface damp in situations not having a good slope, or not well exposed to the sun and air. The limestones are much quarried for building purposes, affording a cheap material; and coal is found and worked at Radstock, and other places sufficiently near (within a few miles), to be readily accessible, at no very great cost, to the inhabitants.

Although some care would be required so to combine the various parts of a system of sewerage for Frome, that the houses on the higher ground, where most level, should be well drained, the chief portion of the town, being on slopes, often considerable, could be most efficiently drained with little cost or difficulty.

the formation of new wide streets and thoroughfares, has been, in a great measure, due to his indefatigable exertions to improve it. In passing through the town by the ordinary thoroughfares, it has a good appearance, and it is only by diverging from them into the old part of Frome that the narrow lanes, alleys, and courts will be found.

Speaking of the former condition of the town, he says, "I have counted three dung-hills in view from one spot in a principal thoroughfare. In the very centre of the town, near the market-place, and principally in a place called Anchor Barton, was such an accumulation of dung-hills, slaughter-houses, and tallow melting-houses, as is undescribable. The principal thoroughfares were narrow lanes. That I may not mistake, I have measured some of them which remain. In the wider parts they are, including two footways, about 16 feet 7 inches; in the narrower parts, 13 feet and 11 feet 10 inches. It required skilful driving, and ascending the footways to pass. Some travellers alighted, and walked through the town to avoid collision." Though the modern improvements have altered this state of things in many places, there is a considerable portion of the town, chiefly occupied by the poorer classes, which still retains its old character.

It would appear that improvements were made under the provisions of a Turnpike Act passed in 1810: 10,000*l.* were raised, and provision for re-payment so arranged that, in 1843, more than 8000*l.* of this sum had been paid off.\* Mr. Bunn observes, that "town improvements are not now permitted to be made with the revenues of Turnpike Trusts; but, in this instance, all the neighbouring roads passed through the town of Frome, and the widening was essential to the convenience and safety of travellers." He further observes, respecting the present condition of the streets:—

20. "Some of the streets, especially the new streets, are of convenient breadth; but many older streets, even those through which carriages pass, are mere narrow lanes. The houses are not built back to back. Some of the courts are closed at the end. There is no arrangement for cleansing. Every individual builds as he chooses."

22. "There is no local Act to prevent the ends of streets being closed up, or to relieve the overcrowding of districts; on the contrary, there is a great prejudice in favour of building in crowded streets, and against the extension and advantageous disposition of suburbs, and against open spaces."

23. "The National School, the Christ-church School, and the Trinity-church School are, in some respects, favourably constructed, and deficient in others. The Infant School, in Vicarage-street, is not so well-constructed. These are all attached to the Established Church. Most of the Dissenters' schools are new and well arranged, with a few exceptions."

*Open Spaces for Exercise. Public Walks.*—There is nothing which can be called public of this kind, unless a raised walk for a short distance on the Warminster-road, named the Coal Ash-walk, can be so termed. Mr. Bunn, always alive to improvement in Frome, has about eight acres of excellently situated ground, on the top of the town, of which he has given part for the Christchurch schools, and proposes to do the like for a savings' bank opposite. This space he seems

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\* It is stated that about 10,000*l.* have also been raised by gifts and subscriptions to build two churches and three schools, and that about the same sum has been expended by the inhabitants in rebuilding their houses.



anxious to devote to public use as a place of recreation, taking a very moderate payment for the ground; but there would appear no public desire to second his views.

A beautiful valley, named Vallis Vale, about a mile from the town, is much frequented, the proprietor, the Marquis of Bath, not interrupting those who walk there.

*Baths.*—The river seems to offer the only place for bathing; but its waters are not over-fitted for the purpose, being impregnated with impurities from the manufactories.

*Supply of Water.*—From the geological arrangements of the clay and limestone beds above mentioned, there is no want of water for the supply of the town, if it were properly collected and delivered to the inhabitants. The impure condition of the river-water prevents its employment for culinary purposes. The spring-water, as might be expected from the sources whence it is derived, usually contains bicarbonate and sulphate of lime in sufficient quantities to make it what is termed “hard.” Respecting the supply of water, Mr. Bunn observes:—

26. “The supply of water is from numerous springs and wells. Generally speaking, families are left to provide their own. There are a few public pumps and draw-wells in inconvenient situations. One spring flows from the churchyard (not a good source). The east of the hill, on which the town stands, is well supplied with springs. There is no supply for watering the streets, except from open springs and pumps, some of which are at a considerable distance; and no supply in case of fire, except what the inhabitants voluntarily bring in buckets.”

Respecting the quality of the water, Mr. W. C. Brand, chemist, at Frome, makes the following statement:—

“I have, at different times, made analyses of the waters, both from springs and wells in the town of Frome. Without an exception, I have found them what are denominated hard waters, which is caused by their containing sulphate of lime and carbonate of lime in solution. For the most part they are agreeable to the taste; but I have met with some exceptions, probably from some impurity in the wells.”

According to the census of 1841, there were 2460 inhabited and 243 uninhabited houses, with 15 building, making a total of 2718 houses in Frome: one that shows but a slight increase in 10 years, since there was a total of 2681 in 1831. Very few of these have water laid into them by any kind of pipes: when that is done, it is at the cost of the owners or occupiers of the premises.

32. “The poorer classes (Mr. Bunn states) supply themselves as they can; 100 families from an open spring near Trinity church;\* 30 families from one (another) well; some from public pumps or draw-wells, and some from the bounty of their neighbours.”

33. “There have been and are many complaints of want of water, and the distances which the poor go to obtain it.”

35. “The quantity is unlimited, but the convenience of the inhabitants is not much attended to. No money is paid, with few exceptions.”

37. “If the way-wardens were to apply the parish funds, not exceeding

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\* From another statement of Mr. Bunn it appears that this spring is the property of a man in humble life, named Flower, who, though possessed of little else than it, freely gives its waters to all who ask, denying no one. He even supplies his poor neighbours with cups and bowls with which to dip the water out of the spring.

*Floods.*—Mills or manufactories requiring dams to be formed for the purpose of obtaining water-power, necessarily tend to impede the natural discharge of flood-waters along a line of river, especially when the general fall of the river-course is inconsiderable. From this cause, and from encroachments made upon the free passage of the river-waters in other than moderate heights of the water, floods are much felt at the lower part of the town.

Mr. Thomas Bunn, a gentleman who has long resided at Frome, and to whom that town is greatly indebted for many important improvements,\* in his answers to, and observations upon, the questions of the Commissioners, sent to him, says, respecting obstructions to the natural drainage :—

4. "There is almost every kind of obstruction. The heavy town bridge is an obstruction. The weirs of the mill below, being built across the river, check the flow of the stream. There are dye-houses and mills above the bridge. Workmen are encouraged to throw cart-loads of rubbish into the river on each side, from the idea that the owner of the adjoining land will gain more ground, or at least preserve his boundary. Sometimes there are meetings of inhabitants, at which partial, but very inefficient remedies are proposed and adopted. At a meeting of chiefly the owners of mills and dye-houses, and of the lands adjoining the river, at which I presided as chairman, they came to a resolution, 'That persons who made obstructions in the river should be prosecuted.' Now to effect this, it was necessary that they should prosecute each other, for they themselves were the obstructors of the river. There are, in truth, two parties, one which benefits by the obstructions in the river, another which is greatly annoyed by the floods. One party will not relinquish their profits; the other, by a little foresight, might have erected their houses above the level of the floods; but they will not take them down and build others. I believe I am the only person who ever took down a house in the lower town and rebuilt it above the usual level of the floods. There are several massive, ill-contrived bridges. The county will not remove them and build better. The town bridge is built in a straggling manner, where the river and the back stream of a mill meet. It consists of five little arches, and very wide piers. Houses are built upon it, though of recent construction."

5. "The houses near the river are flooded, including those in the lower market-place, so as to set the furniture afloat and spoil the shop-goods. The water is very filthy. Part of it flows from the hills, some from the river and dirty drains."

*Sewerage and Cleansing.*—No sewerage, deserving the name, exists. There is surface drainage, into which much house-refuse finds its way, from being thrown into the gutters communicating with the gratings, in the poorer parts of the town; better communications with the drains being adopted for this purpose chiefly in the houses of the more wealthy classes.

There is no public plan of the town, comprehending a system of levels. There is a large public survey of the three tythings into which the town is divided, made chiefly for parish purposes; and there is a reduced copy having the boundary of the four ecclesiastical divisions marked on it. There is also another plan of the town on a scale of three chains to the inch, showing proposed improvements, drawn and

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\* At his own expense he has planted many thousand trees, and the pleasant appearance of Bath-street and some other parts of the town is due to his liberality.



lithographed at the charge of Mr. Bunn, who presents copies to all who may feel an interest in Frome. All these plans are without levels.

Mr. Bunn observes respecting the drainage :—

6. "There are no regulations. The town being chiefly on a hill, with a river below it, affords great facility for drainage. The principal streets are drained; less attention is paid to the courts and alleys, but, generally speaking, the surface is dry. There are no stagnant pools or open ditches."

7. "The town originally consisted chiefly of narrow lanes, which did not deserve the name of streets. About 33 years ago, an Act of Parliament was obtained, and some of the chief thoroughfares were made 40 feet wide, including two footways at the sides. The widened streets are well under-drained. Some of the old streets were previously drained by a subscription made about 35 years since, before which infectious fevers prevailed in the neighbourhood for want of drainage. These have ceased since."

On the subject of privies, it would appear that there are few that do not empty themselves into cesspools; and the few which have their filth led into the drains, contrived for little else than the surface-drainage, are complained of from the want of traps at the gratings. At the national school, built for 600 children, though it was intended that the privies should be built at a proper distance from the school, they are erected so close to it as to have been offensive for 20 years. Respecting privies, Mr. Bunn says :—

8. "Most of them are emptied, and the contents used for manure. Some convey the filth into drains; but this is a bad practice, except near the river, for it only spreads the nuisance over the town, and is offensive at every grate and opening."

9. "The house-drains conveyed into public drains do become offensive."

10. "The town public drains contain deposits, and are offensive at the openings. They are not trapped. The descent of the hill, and an occasional storm of rain, are the chief agents in removing obstructions."

12. "The urine of the poor is purchased by the clothiers, and is used in the manufacture of cloth."

13. "The usual form of the drain is about 18 inches square. In Bath-street there is a circular culvert of about two feet diameter. One drain on Catherine-hill is larger."

14. "The public drains are never cleansed."

With respect to cleansing, the way-wardens, two of whom are elected for each of the three tythings into which the town is divided, and under whom the drainage is also placed, sell the road-dirt. Mr. Bunn, in his evidence, says :—

15. "There are no scavengers."

16. "The poor place their refuse in their coal-holes and sell it for manure."

17. "There are no dust-bins."

18. "There is no deposit for the refuse of the town; it is sold by auction, and removed from the streets weekly for manure, when the purchasers are punctual."

19. "The way-wardens sometimes interfere [for the enforcement of cleansing]: There is no other authority."

*State of the Town as regards Streets, Alleys, and Courts.*—Until about 33 years since, Frome was little else than a mass of narrow streets, alleys, and courts; and it is but justice to Mr. Bunn to state, that the change which has taken place in the aspect of the town, by

a limited amount, to procure water for the poor at very low prices, at their houses, it would be an advantage.”

The following statement respecting an attempt to supply part of Frome with water, laid into the houses or carried to a conduit, is so characteristic of the mode in which such subjects are treated and viewed in some towns, that it should find a place here. The friend to the supply of water alluded to was Mr. Bunn himself:—

“At the time we were excavating Bath-street,\* which is 40 feet wide, and when we had descended about 16 feet, we found a natural spring of the purest transparent water. A question arose whether we should turn this into a dirty drain, where it was not wanted, or apply it to supply the wants of the inhabitants who lived below (further down the hill), where many were without any water; and some who had sunk wells found water which could not be used for domestic purposes.† A friend to the supply obtained permission to form a reservoir to hold 200 hogsheads under the street, so strongly arched over that loaded waggons have passed on the arches for 30 years. Pipes were laid, and the water brought from the hill to the vale below. A small space was enclosed in the lower market-place with iron palisades, and a triangular pedestal raised, in which were placed there brass-cocks, affording a constant supply. Keys were distributed to those who had no water, without compensation. The first symptom of dissatisfaction which occurred was a rigid scrutiny into the expense of building the reservoir: this proved to be only 100*l.*, and the intended censure for extravagance fell to the ground. It was proposed to erect a fountain, as in the Market-place in the city of Wells. In the meantime, the advocate for the supply of water placed on the pedestal, as a temporary substitute, a large marble vase. Some of the people of the town climbed over the iron palisades in the darkness of the night, lifted off the marble vase, which was very weighty, carried it to the bridge, threw it over, and broke it in pieces. Then a report was raised that the water was deleterious and injurious to health. The trustees of the roads very properly ordered it to be analysed by different chemists. All the chemists reported that it was as clear and as wholesome as any water drank in the town. A person procured a pipe to be laid down at the public expense, but not for public use, to supply two houses of his own. He quarrelled with his tenants and cut off the pipe, and consequently these houses have had no water laid on from that day to this, a period of more than 20 years. A gentleman, who had lately acquired a fortune of 50,000*l.*, was building a house; he requested leave to alter the line of water-pipes that he might extend his area. This could not be refused; but the pipes were laid down again so carelessly that the water ceased to flow. The advocate for the supply of water again interfered. He obtained the signatures of seven trustees to a paper approving of the removal of the obstructions in the pipes, and some new materials were ordered. At the next meeting, not one of the trustees who had signed the paper attended. The proposal was discouraged by those present, and the expense incurred, about 10*l.*, thrown on the friend of the supply.

“At a subsequent meeting, it was seriously proposed to remove the little pedestal which had been raised for the benefit of the inhabitants, and sell the materials. The late Mr. Barton, of Corsley, who was wise and prudent, said it was an affair of too much importance to be decided so hastily, and prevented it. At the next meeting, the friend to the supply was absent from illness. The order was made, though the occupiers of houses offered two guineas and four guineas yearly for a pipe, and the little edifice was de-

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\* One of the chief improvements made in the town.

† The wells in the lower part of the town are in the clays and marls named Fullers' earth, and which do not usually afford good water.—*H. T. D. B.*



stroyed. This pure spring, in the centre of a populous town, has, for more than 20 years, flowed from the reservoir into a drain, where it is useless.

"In pursuance of the present inquiry, the friend to the supply of water has visited the houses near the spot where the cocks were placed. He found 12 of them either without water or without any which was fit for domestic use. In one building reside 25 old women, 11 of whom are more than 60 years old, 9 more than 70, and 5 more than 80 years, who are supported by a charitable endowment, and who go from their homes every day with their empty pitchers to beg water. Some of them tremble under the weight, and are scarcely able to carry it to their respective apartments."

41. "There is not on an average one fire in a year."

42. "The engines are soon brought, and supplied willingly with buckets of water by the neighbours."

45. "The inhabitants build as they like."

46. "There are four fire-engines, three of which are in pretty good repair. There are 12 firemen, who exercise the engines four times in the year, namely, on the first Sunday after each quarter-day, for which they are paid 1*l.* 5*s.* each time. If they attend a fire with the engines, their pay is 4*l.* 10*s.* Mr. W. Giles, jun., the secretary to the gas-inspectors, pays the firemen from the gas-rates."\*

*Tenements of the Poorer Classes.*—Compared with the dwellings of the same classes in most large towns, the houses of the poorer inhabitants of Frome, as in many towns of similar size in the same part of England, are not remarkable for want of accommodation, as regards space, though they are usually ill-ventilated and ill-drained—conditions, the bad effects of which are not yet sufficiently understood by the poorer classes, and to remedy which, in country towns more especially, more might be done by themselves than is now accomplished. There are several endowed charities for the poor, the endowments for which are stated to amount to about 1500*l.* per annum.† This sum, regarding the population of the town, is considerable. There is also much private benevolence; and the ladies of Frome have formed themselves into visiting parties for the relief of the poor.

50. "Generally," (Mr. Bunn states), "the houses of the poor are substantially built and covered with stone or slate. The rooms are of sufficient size for health and comfort. The people are under-fed and averse to ventilation. There are some exceptions, where the buildings are close, mean, and confined. The poor have better dwellings than in the poor districts in London."

51. "Usually there is one family only in each house. Sometimes a family receives one or more lodgers. Occasionally different families occupy different floors; the rooms are sufficiently large."

52. "The ventilation of the habitations is left to the feelings of the inhabitants. Sometimes the visiting charitable ladies—and they are many—when the windows have no openings, order the glazier to alter them. Those who are deficient with respect to diet, fuel, and clothing, are not so sensible to the benefits of fresh air, and, indeed, cannot endure it so well as others. At the Union workhouse regulations for air and cleanliness are introduced."

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\* The town seems to have been lit with gas, in consequence of a meeting for that purpose held on the 1st January, 1830, a company composed of 25*l.* shareholders having been formed.

† Among them are an asylum for the education of 40 girls, and the support of 20 old men, and another establishment (the Blue School) for old women and boys. Mr. Bunn remarks that both these charitable establishments are liable to be flooded; the Asylum from want of drainage, and the Blue School from being built in the midst of the river.

53. "I have heard from the charitable ladies who visit the poor, that they scarcely now enter a poor person's room in the winter which has not a moderately comfortable fire. Coal-mines are within six miles, and the supply abundant."

21. "There are no cellar dwellings."

*Lodging-houses.*—There are not many, but two or three of them exhibit the usual amount of dirt, bad ventilation, and crowding. It appears from Mr. Bunn's statements, that,—

55. "Paupers are received, by tickets from the paymasters, at the Union workhouse, where they are entitled to a supper, a clean bed, and breakfast, and are afterwards required to do two hours' work."

*Heath and average Age at Deaths.*—The following is a report from Mr. Thomas Henry Payne, surgeon and registrar of Frome, whose means of obtaining correct information are considerable, upon the mortality and prevalent diseases in that town :—

"This district, for which I am registrar, comprises the parishes of Frome and Rodden; the former, a town containing a population, according to the last census (which was taken under my superintendence), of 11,750, including the neighbouring hamlets; the latter (Rodden) a village with a population of about 200, and adjoining the town of Frome.

"The population is made up of two principal classes, viz., those engaged in the different branches of the clothing manufactory, and the others in agricultural and out-of-door pursuits.

"Those engaged in the clothing department work either at the factory or at their own homes, and are chiefly weavers—men who lead a sedentary life, are more or less addicted (as far as their means admit) to the general habit of beer-drinking, and who, from deficiency of animal food and wholesome air, are the victims of the many epidemics to which this district is so liable; the children inherit the deficiencies, moral and physical, of their parents, rendering them more susceptible to the attacks of the disease which may happen to be prevalent. And when it is considered that these children, so constituted, are exposed to the influence of crowded working-rooms, as well as sleeping-chambers, to say nothing of the want of ventilation and general neglect of cleanliness, the Saturday being nearly the only day on which they think of cleaning themselves, it will not be wondered at that so many fall victims on the invasion of an epidemic.

"There are a great number of these children employed: all work at the mill, crowded together indiscriminately, male and female, in low rooms full of machinery. The heat generated by so many, together with the smell of the clothes saturated with the oil used about the machinery and in different processes of the manufacture, causes a most offensive smell, and must, as there is little or no ventilation, be productive of the worst effects. The greater part of those so engaged have to walk, after the day's work, a distance of a mile and a half, some two miles, in all weathers; and seldom, if wet, change their clothes on their arrival at home, where they eat a meal of potatoes, and then retire to their sleeping-apartment, leaving their clothes to dry as they best may: this apartment is generally occupied by the whole family, and several in one bed. In the morning they resume their damp clothing and their usual toil; and thus the week passes. There is also a set for the night as well as day, who work alternately at the mill. So common and general, indeed, are these facts in most manufacturing districts, that there is scarcely any necessity for adverting to them; but, inasmuch as they form part and parcel of the cause of sickness, I consider it right to advert to them.

"The existence of these circumstances will fully account for the prevalence and fatality of those diseases to which this town is obnoxious, and to which so many annually fall victims.



“I come now to mention those diseases which obtain to so great an extent in this district, and prove so fatal, especially amongst the poorer classes. First and foremost stands—

*“Phthisis.”*—There are annually, on an average, 50 deaths from this disease alone, out of 260, the yearly average of deaths from all causes. In addition, there are nearly 30 cases annually of other diseases of the lungs, chronic and acute. As far as I have means of judging, this is far above the general average of mortality, even in manufacturing towns (with few exceptions), from the diseases to which this organ is incident. I cannot account for the great prevalence and fatality of this disease otherwise than considering them the result of the occupation of the poorer classes, the constant exposure to the vicissitudes of weather, and deficiency of clothing and animal food, &c.

“In remarking on the prevalence of phthisis, I may state the majority of these causes came under my own observation; and, from my knowledge of the individuals, and other circumstances, I had full opportunity of arriving at a correct conclusion as to the nature of the sickness and the cause of death: so that all the cases entered under the head phthisis in the table of diseases may be considered as genuine examples of that disease; whilst other diseases simulating phthisis, or of doubtful description, are referred to the list pneumonites, or other diseases of the lungs and air-passages, according to the best of my knowledge. During the period embraced by the accompanying return, I have had peculiar advantages of ascertaining the exact mortality of this district, as well as the causes of death, being at the same time medical officer and registrar. Although I have always had to contend with the difficulty of obtaining a correct account of the nature of the illness or cause of death, from the inability or indisposition of the medical attendant to give the required information, still, from personal investigation of the circumstances detailed by the informant, I have been enabled to arrive at a tolerably accurate statement of the nature of the disease, and to register it accordingly. It has been always my rule, before giving a certificate of registration, in the absence of sufficient and satisfactory testimony from the proper authority or medical attendant, to make a personal investigation, for my own satisfaction and the furtherance of correct evidence for statistical purposes, being fully impressed with the importance of these means of coming at beneficial and important facts. The difficulty of coming at correct information is by no means lessened by the publication of the nosological table; for without the full co-operation of the medical profession generally, it is impossible to make a uniform and useful return of the causes of death, particularly as it often happens that the application for the certificate of registration is rarely made till the latest period, when there is little time to enable the registrars to make the necessary inquiries as to the nature of the cause of death. Indeed, I am of opinion that nothing short of absolute compulsion on every individual to give due notice of a birth or death will remove this difficulty. I think little confidence can be placed in the registration of births, especially under the present system, inasmuch as there are so many circumstances admitting of an evasion of the registration; that, unless it be made incumbent on all to give notice, it is impossible that the tables can be of any use for statistical purposes.

“There is one great evil which I see adverted to in the interesting report furnished by Mr. Chadwick, and which I know prevails to a great extent as well in this as in other manufacturing towns, and which I consider to be of serious importance, viz., the calling children still-born who have been born alive, but from neglect or intentional ill-usage have soon ceased to exist. This is one great source of the incorrectness of tables relating to statistical investigations. I do not see how these can be correct, when registration takes no cognizance of still-born children, who are undoubtedly as much a part of the population, although from neglect or some difficulty in delivery, pro-



bably mechanical compression, are to all appearance dead, as others who not being exposed to such casualties, are born alive. There can be no question that gross neglect is practised by the loose women who act as midwives to the poor, which adds greatly to the amount of mortality amongst infants, and the consequent evil (generally overlooked) of a quick succession of unhealthy and rickety children. I have frequently seen newly-born infants put aside as still-born, that have been lustily formed, and who in the space of half an hour have astonished the bystanders by its loud cries; and others who, with the ordinary attention and application of the usual remedies generally resorted to on such occasions, have speedily resuscitated. Indeed, so ignorant and unfeeling are the majority of the poor women of this place, that they would rather see their infants perish than have recourse to any measure, and even censure the adoption of means calculated to recover such as are still-born. I have very frequently met with such myself, and I can assert that it is the common practice; and from what I have witnessed repeatedly I can fully corroborate the printed evidence given by other registrars, as reported in Mr. Chadwick's investigations. A reference to the head debility, in the table of diseases I have furnished of deaths occurring in these subjects, will show the great number who die annually after an imperfect existence of a few days or weeks, without manifesting any symptom of disease sufficient to account for death. My intention in making a separate classification of these causes has been to show the large number who perish in this way, and who in all probability might have lived had they received proper and kind treatment. I have good reason to believe that some midwives are encouraged to neglect infants at the birth for this express purpose.

"I have already stated in the explanation of terms at the commencement of this paper, that many causes of death are registered as *decline*, for want of better information, or a cloak for ignorance. This term 'decline' is in very general use in this neighbourhood, and is applied to a large class of causes of deaths. I have, in the appended table of diseases, reported them under the more correct terms of bronchial and other diseases, as my knowledge of the individuals and personal inquiries have enabled me to avail myself of information, as the constitutional tendency, locality, ages, or occupation of the respective parties.

"The general and constant use of such terms as the above constitutes another serious obstacle to the correct return of the actual causes of death, which the publication of the nosological table would go very far to remove, could the assistance of the medical attendants of deceased persons be made use of; but there is a disinclination on the part of the profession to afford this information. And when the registrar does not possess the requisite qualifications himself to enable him to make the necessary inquiries, the registration of causes of death cannot be relied on.

"I have generally observed that the greater number of deaths registered as *decline* (when they are of advanced age), to be those arising from chronic bronchitis, asthma, &c., and when I have been able to come to this conclusion, I have so registered them. I make this observation in order to account for the fact of the different arrangement of the causes of death in the tables as compared with the causes of death given in my register-book of deaths, as also for the purpose of expressing more correctly the causes of death, and thus leading to more accurate statistical deductions.

"*Common continued fever* prevails to a great extent in this district, and arises from the same causes as stated before; but it is not particularly fatal, save where, from deficient treatment, unfavourable locality, or bad diet, it terminates in low fever or typhus, when it is almost always fatal. The subjects of this fever are principally the children of the manufacturing classes, who live in crowded and ill-ventilated apartments, subject to the evils arising from deficient sewerage and other well-known causes, which are a constant source of malarious effluvia. The mortality from this disease



is pretty much the same annually, as a reference to the table will show. The past year (1843), measles and scarlatina have been very prevalent, especially the latter, which has proved very fatal; there being double the amount of these diseases conjointly than any preceding year.

"I may observe that typhus and other fevers are not so rife since the exposures made by the reports furnished by the medical officers under the Poor Law Commission, when the nuisances productive of so much mischief, were pointed out and removed. Prior to this period we had annually some epidemic to contend with, which, in spite of every kind of treatment and the greatest care, proved extremely fatal; abundantly showing the advantages to be derived from the establishment of police regulations to remove the manifold sources of malaria. There can be no question as to the advantages to be derived from investigations made by properly appointed officers of health.

"The last epidemic of any consequence by which this town was visited, carried off nearly 100 children, chiefly of the poorer classes; but, as is always the case, the higher classes suffered more or less. . . .

"Under the heads accident, violence, and sudden death, &c., are registered those which in all probability would more correctly have been put under other heads; but in consequence of the general carelessness and indifference with which such subjects are treated, and the ignorance of juries impanelled on such occasions, there is too much reason to suppose that many cases of manslaughter, if not of murder, have been overlooked, which under different arrangements would have assumed a different aspect. There are annually 13 deaths arising from such causes.

"It is seldom with us that any light is thrown on suspicious deaths by the investigations instituted under the coroner's warrant; and from ignorance, coupled with indisposition, the most suspicious circumstances are disposed of by the comfortable verdict of visitation of God, thereby saving time and trouble, some investigation, and enabling parties who are grossly culpable to escape. If one-half the inquests held unnecessarily in this town were dispensed with, and the extra time so saved devoted to the full investigation of those cases where decidedly suspicious circumstances present themselves, it would be more conducive to the general benefit, and the public would then have some security for their lives and health.

"The public buildings in this town are three—asylum, almshouse, and the workhouse. The first and second of these houses are occupied by old people—in the former males, and in the latter females; the deaths occurring here are, of course, from age.

"With regard to the workhouse the case is different. Here a large number of persons are congregated; the apartments generally are crowded and ill-ventilated, particularly the sleeping-rooms, where there is not only not sufficient room for the beds, nearly all of which touch each other, but in some cases two children in one bed. This was the practice when I held the office of medical man to this establishment. Since this period an hospital has been built, which doubtless has removed some of these evils, and the sick can be separated from the healthy. The absence of this arrangement, when I was medical officer, rendered the mortality very great amongst the children during an epidemic. The highest number at any one time resident in the workhouse I believe to be 350; the lowest from 200 to 250. The number of deaths average annually 28. The diseases most prevalent and causing this mortality are diseases of the lungs and mesenteric disease; the former with the adult portion of the inmates, the latter with the children, and proves very fatal. Nearly all the children present a squalid unhealthy appearance, indicative of the scrofulous diathesis, which is the bane of workhouses.

"I can safely state, from the constant observations I have been in the habit of making, that great benefit would accrue from the institution of

sanatory laws and properly appointed officers of health, as in the continental towns."

From the returns furnished by Mr. Payne, the following table has been constructed.

EXTRACTS FROM REGISTRIES OF DEATHS for the FROME REGISTRATION DISTRICT—  
Years 1839, 1840, 1841, 1842, and 1843.

	Total Deaths.	Average Age at Death.		Number of Deaths from Consumption.	Number of Deaths from Epidemic Diseases.	
		Above 5 Years.	At all Ages.		Under 5 Years.	Of all Ages.
		Yrs. Mon.	Yrs. Mon.			
Gentry, &c. . . . .	29	63 5	54 8	3	..	1
Tradesmen, &c.. . . .	227	40 11	26 7	63	20	49
Manufacturers, &c.. . .	358	53 3	36 10	63	31	61
Agriculturists, &c. . . .	256	50 2	35 11	55	22	40
Artisans, &c. . . . .	361	48 2	33 3	97	25	51
Undescribed . . . . .	24	55 8	39 5	4	2	5
Paupers . . . . .	141	53 11	32 3	13	15	24
Totals . . . . .	1,396	49 9	34 0	298	115	231

Mean per centage of Deaths for the 5 Years, 2·3.

From this it appears that the mean age at death of the different classes of the population varies materially, more especially when those who die at five years and under are deducted. While, including all ages, the average age of the gentry is as high as 63 years, that of the tradesman is only 41 years; one much beneath that of those included under the heads of Manufacturers, Artisans, Agriculturists, or Paupers. This difference is equally apparent, when those who die at and under five years are deducted; for it then appears that, while the average age at death of the gentry for the five years (1839-43) is 54 years 8 months, that of the tradespeople is 26 years 7 months. The difference, when the deaths at and before five years are deducted, is very considerable for the other classes, showing the large numbers who perish at and prior to five years.

The manufacturers, by this table, attain a higher average age than the agriculturists, the average age of the artisans being less than either. The pauper children who perish at and under five years, make the greatest difference in the average age at death, as without them the average age of this class is 53 years 11 months, and, including them, 32 years 3 months.

Respecting consumption, it would appear that, of the deaths among the gentry, 1 in 9·7 thus perished; among those of the tradespeople, 1 in 3·6; the manufacturers, 1 in 5·7; the agriculturists, 1 in 4·6; the artisans, 1 in 3·7; the paupers, 1 in 10·8. From this it follows, that the tradespeople and artisans suffer most from this disease.

As regards epidemic diseases, 1 in 29 of the deaths of the gentry is referred to them; while, for the tradespeople, it is 1 in 4·6; for manu-



facturers, 1 in 5·8; for the agriculturists, 1 in 6·4; for the artisans, 1 in 7; and for the paupers, 1 in 9·4.

Excepting the deaths of the gentry, a large portion of the deaths by epidemics take place at or before five years of age; two-fifths of the children of the tradespeople thus dying, and about one-half of the other classes. Appearing to point out, that while from the good sanatory condition under which they are placed, and the ready attainment of medical advice, the gentry rarely lose their children by epidemics, from the lessened advantages possessed by the tradespeople, two-fifths of those of that class are swept off at or before five years of age, and a still increased amount of mortality by epidemics is felt among the manufacturers, agriculturists, and artisans.

The returns of mortality for Frome show that 1 in 5·5 of the total deaths was from phthisis, and 1 in 21·8 from pneumonitis; 1 in 10·7 was from continued fever and typhus; 1 in 11·8 from debility, chiefly new-born infants; 1 in 10 from diseases of the brain and nervous system; 1 in 23·4 of dropsy; 1 in 49·3 of accidents; and 1 in 5·5 of age.

It also appear that 1 in 4·6 of the total deaths was from consumption, a rate of mortality from this cause greater than for all the towns noticed in the Swansea Report with the exception of Ipswich; so that it becomes a marked disease for the population of Frome.

It appears also that 1 in 6 of the total deaths was from epidemics, about one-half of which is of children of and under five years of age. In this respect Frome presents a more favourable result than all the towns noticed in the Swansea Report, with the exception of Yarmouth and Whitby.

The per centage of the population who die annually at Frome is above the average; and the class of persons who attain the least average age, and who suffer most from consumption and epidemics, are the tradespeople. Few of the shops at Frome are of large size, and many are small, while their domestic apartments are often confined and ill-ventilated, as much room as possible being afforded to the shops.

The average age at death of the agriculturists and of the artisans, taken with the manufacturers, and of all ages, is much the same; the manufacturers standing higher than the agriculturists, and the artisans below them. The manufacturers suffer less from consumption than the artisans, but more than the agriculturists; while from epidemics the agriculturists sustain less loss than the manufacturers, and more than the artisans.

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## REPORT on the SANATORY CONDITION of SWANSEA.

BY SIR HENRY T. DE LA BECHE.

*Situation.*—Swansea is situated at the mouth of the river Tawe (as its Welsh name of Abertawe implies), at the back of the bay which bears its name. It is chiefly built in a north and south direction on the right bank of the river, along which a line of wharfs extends, some also being constructed on the left bank. Though the mass of houses

chiefly occupies a direction from north to south, the southern portion of the town expands in a western direction along the communications leading to the Mumbles and Gower.

The river is tidal, the tides flowing considerably beyond the town, and finds its way through a natural break in a range of hills, having an east and west direction, and an elevation varying from about 400 to 500 feet. Cilfay Hill, on the east of the town, thus cut off from the general main range, being 633 feet above the sea.

From the base of the Town Hill there is a gradual slope of ground to the more flat portions immediately adjoining the sea, and a very fair fall of surface from the more northern portions of the town to the river Tawe. Northward of the more narrow part, where the range of hills above noticed is naturally broken through, much low land extends for about two miles towards Morristown and Llansamlet, and on this, or adjacent to it, rising slightly towards the hills on either side, are the copper smelting works, the volumes of gaseous products and smoke discharged from which give such a character to this town; one shared in a minor degree, from the same cause, by Neath and Llanelly, and the village of Tybach, all within a distance of 12 miles.

On the west, numerous villas are dispersed over the undulating ground in front of the range of the Town Hill.

*Climate.*—The data for correct information on this head are not so ample as could be desired; from the kindness, however, of Mr. John Jenkins, F.R.A.S., who is now proceeding with careful meteorological observations at Swansea, approximative knowledge on this subject has been obtained, sufficient for the present purpose.

The following table of the mean temperature for several years is constructed from reductions, by Mr. Jenkins, of the observations made by the late Dr. Edwards, by Mr. Gutch, and by himself.

	Mean Tempe- rature.		Mean Tempe- rature.		Mean Tempe- rature.
January . . .	39.11	May . . .	55.72	September . .	58.5
February . . .	41.68	June . . .	62.1	October . . .	52.45
March . . .	44.5	July . . .	63.45	November . .	46.4
April . . .	49.	August . . .	63.16	December . .	42.85
Annual Mean . . . . .		51.49			

By comparing the mean temperature of the months, thus obtained, with those for Bristol, it would appear that while the months of October, November, December, January, February, and March, do not materially differ at both places, the other months show a higher mean temperature at Bristol than at Swansea, making the mean annual temperature higher at Bristol than at the latter; a result, supposing it to be borne out by future inquiry, and making allowance for the temperature at Bristol having been observed in a town, and at the bottom of a hill, which would seem to show the cooling effects of proximity to the sea and of the winds passing over it.

With respect to prevalent winds, of such importance when the absence or presence of the gaseous products and smoke in the town from the copper-works is to be considered, the data are also somewhat



different. Taking the tables furnished by Mr. Jenkins, it would appear that the number of days for N. and N.E. winds, those which would convey the "copper-smoke," as the combined gases and smoke are termed, into the town, were—

	For	N.	N.E.	
	1820	64	63	= 127
	1821	106	23	= 129
	1822	103	32	= 135
	1824	97	59	= 156
	1843	48	92	= 140

making an average of about 137 days in the year, or less than one day in three, in which the copper-smoke may be expected in the town. It does not appear how far land breezes, bringing down the copper smoke into the town during the season for land and sea breezes on this coast, may be included in this calculation.

From information obtained from Mr. W. Roper, lighthouse-keeper at Swansea, and communicated by Mr. W. Bevan, the average number of days would be less than noticed above, and above one in four when the copper-smoke would be carried down over the town by the winds.

It does not appear that the amount of rain which falls has been accurately kept. The following, from the tables furnished by Mr. Jenkins, may tend to show the number of days stated to be wet or showery during the years mentioned :—

		Showery.	Wet.	Total.
	1820	126	41	167
	1821	91	72	163
	1822	139	74	203
	1824	184	36	220
	1838	58	45	103
	1839	76	70	146
	1843	94	63	157

Taken as a whole, the climate of Swansea may be considered as mild and damp—a character which might be expected from its geographical position.

*Geological Character of the Ground on which the Town and Suburbs stand.*—The fundamental rock is that intermixture of sandstones, shales, clays, and coal, known as the coal measures,<sup>8</sup> containing numerous beds of coal, worked in the adjoining country, and to the abundance and small cost of which the town is chiefly indebted for the copper-smelting and other works carried on in and near it.

From the manner in which the more porous sandstone and other beds are mingled with those which are comparatively impervious to the passage of water, the inclination and surface exposure of the beds, the dislocations in their continuity, and from other natural interruptions to the solidity of the strata, commonly termed "joints," there is no

want of springs in these rocks, and such are found in the range of the Town Hill.

Very little of the town is actually built on the coal measures, but upon detrital accumulations, consisting of gravel, sand, and clay, which cover up this rock at Swansea, and the lower and southern part of the Town Hill extending thence to the westward; similar accumulations occurring on the eastern side of the Tawe, and in front of Cilfay Hill.

The gravel is chiefly at the surface in the higher parts of the town, and the clay predominates at the lower portion towards the sea, much of it being apparently in a great measure continued from that clay in Swansea Bay, which, with its often embedded trees, is one of the examples of the so-called submarine forests, part of the land having been depressed, relatively to the sea level, since the trees (oak, &c.) grew on the clay. Blown sand accumulates upon this and other clays, and upon the gravel along the coast of the bay, extending even up to Swansea.

The intermixture of the gravels, sands, and clays, affords the conditions necessary to obtain water by means of wells; but, at the same time, it also affords those which in a neglected drainage enable the liquid portions of cesspools and other receptacles for refuse and filth to percolate and mingle with the well-waters.

Though some care must be taken in arrangements for drainage in the low and extending portion of Swansea towards the west, the surface generally, and the geological character of the ground, present no obstacles to an efficient and proper drainage of the town.

*Floods.*—When freshes from the mountains swell the Tawe, and are met by the in-coming tide, the low grounds above the town become flooded, especially at high spring tides; but, from the situation of the town, little damage is done to it from such causes.

*Sewerage and Cleansing.*—An Act of Parliament was passed in 1809 (49 Geo. III. cap. 79), intituled “An Act for the better Repairing, Cleansing, Lighting, and Watching the several Streets and other Public Passages and Places within the Town and Franchise of Swansea, in the County of Glamorgan, and for removing and preventing nuisances, annoyances, and obstructions therein.” Under the provisions of the Municipal Reform Bill the powers under this Act became vested in the town-council, who now exercise the powers given by it.\*

There is a general kind of map of the town in the town-hall, but it contains no system of levels. It is stated that the Water-works Company possesses one on which some levels are given.

Nothing deserving the name of a system of drainage can be said to exist.

Dr. Bird, ex-mayor of Swansea, to whom the questions of the Health of Towns Commission were sent, says:—

“There is no system of drainage of a regular or efficient character; drains and sewers are occasionally formed, and when out of repair they are, or should be, by law, put in order; the same when otherwise defective, or when accumulations occur.

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\* Since this Report was written, a new Act has been passed (7 and 8 Vic. c. 11), greatly enlarging and amending the powers of the local Commissioners. Its powers are vested in the Corporation and 12 Commissioners, specially appointed in the Act.



"The arrangements of the public sewers are extremely ill conducted and badly managed; system there is none at all; and in many parts of the town there is no drainage or sewerage whatever.

"The Paving and Lighting Commissioners have certain powers as to forming drains in the town; but these powers are not sufficiently comprehensive or efficient in their nature to be acted on, in anything like adequate perfection; nor are the present funds of that Trust equivalent to such a burden.

"The inhabitants, as a whole, have so long been accustomed to the present ill-conducted and efficient drainage, that I do not apprehend anything short of a compulsory enactment would induce them to observe efficient drainage and sewerage, or to make the requisite outlay of money to carry out such a work, although, perhaps, no individual would gainsay its being necessary.

12. "A large proportion of the refuse of the town, that is, of the street washings, is permitted in many places to remain on the surface, where it either taken up by evaporation, or allowed to soak into the subsoil, or both. In many places there are drains communicating with the town-sewers, into which such fluids run: however, these are not by any means arranged in a systematic manner, nor are they general. Slops, soap-suds, dish-water, urine, ordure, &c., are thrown out at the doors of cottages frequently into the streets and gutters immediately in front of the houses.

"A large number of the water-closets and privies have no drains, and the contents are allowed to soak into the adjacent soil, so far as is practicable. In many parts of the town water is to be found on digging a few feet from the surface, and the upper soils chiefly consist of sand. The percolation, therefore, of the filth cannot but produce its effect, and add other impurities to those already contained in solution in the water.

"A more filthy, unwholesome, and disgusting nuisance than the practice involved in this particular query I cannot imagine, and I am sorry to say it is by no means an uncommon one. I have seen ordure thrown into the gutters and on the public gratings in some of the principal streets of the town.

13. "The branch house-drains are of every description of form and size, not exceeding one foot, at the will of the owners.

"The greater number of the public drains are circular, two feet in diameter, but there are a few of larger dimensions, being 3 ft. 2 in. by 2 ft. oval. The average cost of the two-foot drains, including excavations, is about 2s. 8d. per foot; and of the larger drains, about 3s. 6d. per foot.

14. "There are cesspools or catchpits contiguous to the gratings; which convey the surface-water of the street-gutters to the covered drains. These are cleaned weekly, at an expense of about 2l. per annum. Whenever it is necessary to clean the main sewers, they are opened from the surface, and the dirt removed by manual labour, at an average expense of 10l. per annum, making the total annual expense for cleaning sewers about 30l. per annum. These sewers are used only for carrying off the water from the streets and houses.

8. "Many of the houses have no necessities, and many necessities have no drains.

"There are no public necessities, but nearly every street, pavement, and road-side walk are used for such disgusting purpose nightly,—and daily, too, in many instances.\*

9. "The house-drains are not properly cleaned by water or other means, and they often emit offensive smells.

10. "There are no means of preventing accumulations in the sewers.

15. "Scavengers are appointed and directed to be paid in pursuance of

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\* By § 127 of the late Act, the Commissioners can require the owners of houses to build them.

the Act of Parliament, passed in the 49th of Geo. III. c. 79, 20th May, 1809.\*

16. "The sum paid for scavenging this town is about 198*l.* per annum for the whole of the work the scavengers are to perform. This work comprises the whole duties of public scavengers. They are bound by law to go into places inaccessible to carts, but they, as may be expected, miserably neglect this duty.

17. "Many of the houses of this town have no receptacles for dust, &c., consequently these inhabitants keep their dust, ashes, &c., in baskets or hampers, or else, as is very commonly practised, they throw all their offal, slops, filth, ordure, and ashes into the public street before their dwellings, or deposit the ordure on an adjacent public grating, and throw the ashes into some corner near at hand.

"The scavengers' duty is imperfectly done: the scavengers profess to go into all parts of the town once a-week, but this is not done. In many places they do not make their appearance once in three months. I am of opinion that the scavengers receive about one-half the sum which would enable them to perform their duty properly, and that they perform about one-third of the duty to be done.

18. "The refuse and ashes of the town are deposited in a field, on the road-side between the town and the infirmary. This field is near the gas-works. I believe the whole or nearly so is disposed of by sale.

19. "The powers for the above purposes vested in the local authorities are not adequate.† The 'Paving and Lighting Act' is a very defective one, and much requires revision.

20. "The houses are either in some instances isolated, or they are ranged in streets, terraces, and courts, all of which are as irregular in their arrangement as can well be imagined. Many of the houses are built back to back; many of the courts are closed at the ends. The 'arrangements' for cleansing are not good, and the cleansing itself is, for the most part, very imperfectly effected; and generally speaking, the courts, streets, and passages, are not only kept filthily, but are disgustingly dirty.

"I was at one period of my life in the habit of going into some of the worst parts of London, which were, in my opinion, not more dirtily kept than many of the courts, alleys, and lanes of this town.

"The public 'arrangements' for cleansing consist in the scavengers' work; they profess to go into all the parts of the town once a-week for that purpose; their work is wretchedly performed: for instance, there are four carts employed, and eight men; this for a population of about 20,000 souls, and five miles of streets. And, in addition to the inefficiency of power before named, for the purposes of cleansing, the arrangements themselves are badly and inefficiently conducted as to time, method, &c. The means requisite for enabling the inhabitants themselves to keep their courts and alleys clean, such as privies, free supply of water, &c., are miserably deficient in many instances."

*State of the Town as regards Streets, Alleys, and Courts.*—Though there are several wretched alleys and courts, much of the town of Swansea is composed of open streets, readily swept by the winds, and if kept clean, would have a wholesome character; but inattention to efficient drainage and scavenging gives such an air of neglect to many situations, not ill arranged as regards lines of houses, that the general

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\* The clause relating to these duties in the old Act is more stringent than that contained in the new Act. It requires the scavenger to perform his duties at least once a-week. In the present it is left to the direction of the Commissioners, § 127.

† These powers are considerably enlarged. Nuisances of this description can now be abated, § 133.



impression produced is commonly one of more faulty construction than is merited.

Dr. Bird says—

5. “ People build where and how they please, and there is no law to prevent them, except as to roofing, party-walls, and some other ordinary matters contained in the ‘ Paving and Lighting Bill.’

6. “ These regulations are miserably bad. The streets are ill laid, and often not paved at all, and stagnant pools are contiguous to dwellings.

21. “ I am not aware of there being any cellar residences in this place, nor can I on inquiry learn that any portion of the inhabitants dwell in such places.

22. “ There is no provision for preventing the ends of streets being closed up; such an one is much needed, I should say.”

*Supply of Water.*—The means of supplying the town with water are ample, more particularly since the establishment of a water-works company, whose reservoir is formed between Parkwern and the Rhydings, two miles distant from the town, at a sufficiently commanding height above it, the mains being conducted down the valley, at the upper part of which the reservoir is constructed, and along the Mumbles road into the town. The water is of good quality, and might readily be introduced into the houses under constant pressure, if thought desirable.

Much time and labour is now consumed by the poorer inhabitants in fetching water, both from the wells and the springs.

Respecting the supply of water, Dr. Bird, in his replies to the questions of the Commissioners, says—

26. “ The town of Swansea is supplied with water, either by means of pumps, some of which are public pumps, by means of a stream of water in the upper part of the town, near Mount Pleasant, to which all persons have access who choose to avail themselves of it, and by means of leaden pipes attached to the Water-works Company’s mains.

“ For the prevention of fires and watering the streets, the supply is drawn from the mains of the Water-works Company.

27. “ The water is generally liked. No analysis has been made that I am aware of.

28. “ The town is supplied with water by private and public pumps, and by lead pipes from the iron mains of the Water-works Company. The upper parts of the town are supplied principally from running streams.

29. “ About one-fourth of the inhabitants are supplied with water from the water-works mains.

30. “ In the year 1839, I find by a Report of the Royal Institution of South Wales, the following statement :—

*Town of Swansea (within the Turnpike-gates).*

Houses—Private dwelling-houses, with or without shops, warehouses, offices, &c., &c., attached . . . . .	1859
Hotels, inns, public-houses, and beer-houses . . . . .	162
Vacant houses . . . . .	144
Churches* . . . . .	2
Chapels . . . . .	17

“ Since this period the town has gone on increasing.

“ I am unable to state the number of houses in the suburbs, but they are numerous.

\* There are now three—1844.

31. "The water is laid on in about 470 houses. Each house has a separate tank, and has an unlimited supply of water.

32. "The poorer classes are supplied by public pumps, or from wells and streams in or near the town, of which there are several.

"There is no provision of a public nature which supplies the poor gratuitously from the water-works mains, nor are any stand-pipes permanently affixed to any part of the mains in public streets or places. This might easily be done.

"I suppose some of the poor find a want of water; some people get a living by vending water in casks about the town, and retail it at so much a pailful.

33. "I have not heard any such complaints; but at first the iron-rust of the pipes gave the water a red tinge; however, lime will remedy this evil, and it is fast decreasing.

34. "A house under 8*l.* rent pays 10*s.* a-year for water to Water-works Company.

	£.	£.		s.
Above rented from	8	to 12	.	12
„	12	to 15	.	15
„	15	to 20	.	20
„	20	to 25	.	25
	&c.			&c.

"Beer-houses pay two guineas per annum.

"Breweries pay three guineas per annum.

35. "People are supplied with an unlimited quantity.

36. "The Act of Parliament of the Water-works Company limits the amount to be paid for water.

37. "I apprehend the present water-works reservoir is sufficient for the town, were it three times its present size.

38. "I believe that filters are seldom used.

39. "It is kept on constantly, night and day, throughout the year.

40. "There are fire-plugs.

42. "It depends upon circumstances. Generally from a quarter to half an hour.

43. There are fire-plugs in all the principal streets.

44. "Eighteen fires in houses, warehouses, and workshops have occurred in the last eight years, and two on board ships. Three of them were destructive; the buildings being burnt down. Another happened in an unfinished house, and all the wood-work was destroyed. The remaining 14 were subdued without serious injury being done to the premises. With regard to the above-mentioned ships, one was burnt to the water's edge; the other escaped with less injury, the fire not extending beyond the cabin.

"The greater number of fires arise from overheating the flues; but some from causes that cannot be assigned.

45. "I am not aware of any houses or large ranges of buildings that are wholly unprotected by party-walls, though in many cases sufficient care is not taken to make the party-walls thick enough to form a proper protection from fire for the primer joints, &c.; particularly in houses of the smaller class.

46. "There are well-constructed engines, two in number, and I think they are well worked. They are placed under the care of an expert tradesman to keep them in order, and occasionally practised by the police and fire-brigade. I think they are well and efficiently worked."

*Public Baths and Bathing.*—Numbers of persons from the interior, including many of the men engaged in the iron-works at Merthyr Tydfil, with their wives and families, come annually to bathe in the sea, at Swansea, the sandy coast being favourable for the purpose, and many



in the town avail themselves of the opportunities thus afforded. In answer to the question on this head, Dr. Bird observes—

25. "The sea reaches up to the town, and certain parts of the shore are appointed for bathers. There are not any public baths, excepting one very indifferent hot-bathing establishment."

*Public Walks.*—The pier may, to a certain extent, be considered a public walk, as there would seem every desire on the part of the authorities to keep it in good condition for the purpose. The wide spread of sands at low water affords an ample field for wholesome exercise.

*Provisions for Health at Schools.*—Under this head Dr. Bird states—

23. "At the infants' school there is a good play-ground. I am not aware of any instance of a similar arrangement in this town.

"The light is generally good.

"I believe they are all supplied with privies; the drainage is defective.

"I am speaking of the schools for the poor which are *public*.

"The private schools at 2*d.* a-week, and such places, for educating the poor are often wretchedly off in the way of accommodation of every kind."

*Lodging-houses.*—These are numerous, and present the usual characteristics of over-crowding, bad ventilation, and want of cleanliness. In Dr. Bird's answers he presents us with the following account of "lodging-houses," and their inhabitants, given him by the Inspector of Police for Swansea:—

55. "Mr. W. Rees feels sure there are 60 low lodging-house or beggar-hotels in this town; in some of these he has seen 16 persons sleeping in the same room, Irish, Scotch, and Welsh, consisting of wives, husbands, children, and single people, all in the same room. He has seen six or seven in the same bed, *i. e.*, a man, his wife, and children. These lodgers pay from 2*d.* to 3*d.* per night, before they go to bed. Mr. Rees thinks there must be from 250 to 300 of the commonest prostitutes at Swansea. They are very debauched in their habits as regards drink; many of them sleep on straw in a corner of the room, whilst they allow ordure to cover the floor, or throw it with the ashes; so dirty are their domestic habits. In some cases, several take a small house together, whilst others live in lodgings. There are many prostitutes of a better kind; these are more decent in their habits and dwellings."

*Accommodation for the Poorer Classes.*—The number of small or cottage houses inhabited by the labouring classes is striking; and Mr. Bevan, surgeon and registrar of Swansea, attributes much of the comparative healthy state of Swansea to this circumstance. After adverting to the good diet usually obtained by those engaged in the neighbouring copper-works, and the fairly constant occupation of the working classes at Swansea, he observes:—

"Another main-spring of health is the occupancy of distinct houses by each family. The practice of cottage-building prevails at Swansea to an extent seldom witnessed in the manufacturing districts of England, and as a natural consequence, we seldom find more than one family located in each house. We have nothing of what is so common in other crowded districts, tenements, comparatively large, containing three, four, or even six different households, to the manifest detriment of the independence, comfort, cleanliness, and health of all. In such abodes, habits of dirt or dissipation in one, contaminate and annoy the whole, contagious dis-

temper take a wider range, and the number of victims must necessarily be increased.

“A proof of the advantages enjoyed by our working classes in this respect may be deduced from the fact, that the number of houses in the town of Swansea, with its population of 16,448, is 3,369, and that, of the whole, 1,400 are cottages, paying a rental not exceeding, but more frequently under, 5*l.* per annum. In the statistical returns of the Royal Institution of South Wales for 1839-40, revised by Mr. Jenkins, M.A. and Mr. Williams, we find that the proportion of families to inhabited houses is as 1·2 to 1, within the gates, and without the gates, the number of houses is equal to that of families. An obvious consequence of this separate occupancy, and one constituting an important sanatory feature, is that our dwellings are not overcrowded, the proportion of persons to inhabited houses being as 6·99 to one within the gates, and in the district generally as 6·24 to 1.”

The following table, taken from the Statistics of the Swansea Union, by Mr. J. H. Vivian, Member for Swansea, published in 1844, shows the number of persons for each inhabited house for 40 years, 1801 to 1841, both inclusive, and that no material change has taken place in that respect for that time, the number being from 5 to 5·03. It also shows the number of persons in each family for 30 years (1801 to 1831), which also differs little during that period, and probably is now much the same, as also appears the case with the proportion of families to each inhabited house :—

Calculations on the DATA extracted from the POPULATION RETURNS.

SWANSEA TOWN AND FRANCHISE.										
	Houses.				Persons.					
	Inhabited Proportion in 100.	Uninhabited Proportion in 100.	Increase per Cent. of Houses in each period of Ten Years.	Proportion of Houses Building to Houses Built per Cent.	Proportion of Families to each Inhabited House.	Number of Persons to each Inhabited House.	Number of Persons to each Family.	Increase per Cent. of Persons in each period of Ten Years.	Proportion in 100.	
									Males.	Females.
1801	98·25	1·75	..	..	1·27	5·16	4·05	..	41·46	58·54
1811	93·86	6·14	40·90	·41	1·16	5·15	4·44	34·38	45·19	54·81
1821	96·06	3·94	25·84	1·40	1·04	5·	4·83	25·12	44·28	55·72
1831	95·13	4·87	27·24	·89	1·11	5·13	4·61	29·26	44·44	55·56
1841	95·80	4·20	21·78	1·94	..	5·30	..	26·63	56·83	53·17

With respect to accommodation for the working classes, Dr. Bird says, in his evidence—

55. “Many of the mechanics, sailors, and labourers lodge with people of their own class, and are provided for in the same manner as are those at whose abodes they reside. Here the state of such houses, which may be termed lodging-houses for the poorer classes, varies with the means, habits, &c. of those who live in them; some are comfortable, others the reverse.

“The following is given me by the Inspector of Police for Swansea, and Mr. Morgan, Relieving Officer of the Swansea Union :—

“Families sleeping in rooms promiscuously at night, even amongst respectable cottagers, is not uncommon at Swansea; he knows it to be so, and when there is only one room up-stairs, and one down, and the family



numerous, this must be the case. The disposition to be orderly averages pretty fair. He thinks these instances of persons promiscuously sleeping in the same apartments, arises more from necessity than a disposition to do so. Houses having only two rooms are numerous in this place. Houses of this description have frequently been built here within the last ten years. There are some such in course of erection now, but commonly of a better sort; latterly, in erecting these houses of two rooms, a slope behind is, generally speaking, added; some of these slopes contain a small bed-place. These two-room houses vary in rent from 4*l.* to 4*l.* 10*s.* and 4*l.* 19*s.*; the last-named rental is generally believed to exempt people from rates, being 1*s.* less than 5*l.* Mr. Rees says, that in some of the smallest houses two married families live, and many contain lodgers, in addition to the tenant, his wife, and children. The partitions between rooms at Swansea are generally perfect, and not partial. There are a great number of cottage residencies having no privies or water-closets, consequently ordure is frequently deposited on the pathways, public gratings," &c.

*Health and average Age of Inhabitants.*—In a locality where from the gaseous products evolved from the copper-works vegetation is destroyed around them, particularly westward, towards which the prevalent winds more frequently drive the copper-smoke, so that on the exposed side of Cilfay Hill no plant can grow, and the very soil is washed from the subjacent gravel and rock from the absence of protecting vegetation, and where, moreover, the glass in the windows of the town is corroded from the same causes, it becomes an especial object of interest to see how far the condition of the atmosphere may affect the health of the population within its influence.

The gases evolved from the copper-works consist (independently of the products resulting from the combustion of the coal employed as fuel) of sulphurous, sulphuric, arsenious, and hydrofluoric acids; the three former chiefly driven off during the roasting of the sulphuret of copper, and the double sulphurets of copper and iron, which constitute a large portion of the copper ores smelted at Swansea, the arsenic being sometimes intermingled with these and other ores, and the hydrofluoric acid being produced from the fluor spar (fluoride of calcium) sometimes contained in the ores, and from the same substance employed as flux.

The sulphurous and sulphuric acids are the chief products; the former being invisible, and sulphuric acid, in a state of white vapour, being the product most apparent. These, with the smoke arising from the combustion of the coal, constitute the body of the *copper-smoke*, for the arsenious acid becomes soon arrested, and the hydrofluoric acid probably does not extend to any considerable distance.

Many plants cannot be grown within the range of these vapours even where they become, as it were, diluted with the pure air: the colour of the *convolvulus major* has been known to be changed to red, after a few hours' driving of the copper-smoke, at the distance of two miles from the works; and the horses and cattle that feed upon the grass, where it can grow within the range of much of this smoke, are affected with a great thickening of the knee-joints, and their teeth suffer, so that they must be frequently removed from such localities to preserve them.

Lofty chimneys have been adopted at many of the works as a means of somewhat abating the evils arising from the "copper-smoke;" and probably the arsenious products are much arrested thereby; but it has been stated that these chimneys only diffuse the sulphurous and sul-

phuric acids over a wider area. Many plans have been offered, and some tried to abate, or entirely to arrest, the noxious vapours discharged from the copper-works. At the present time, however, from the increase of these works, during late years, the volumes of noxious vapours evolved must be enormous, and the prevention of their discharge into the atmosphere is a subject of pressing importance, one to which it is stated many of the heads of these great copper-smelting establishments are well disposed to give the utmost attention.

Independently of the copper-works, there is a chemical establishment situated among them, the vapours from which are also offensive, and much complained of by the inhabitants within their range.

Although it might be considered that vapours which clearly caused such destruction to vegetation could scarcely fail to injure the health of persons coming within their range, the general impression seems to be, that these vapours by no means produce the serious consequences to health that might be supposed. It is stated, that in proportion as the copper-works have been extended, ague, which once prevailed in the low grounds near the course of the river, to the northward of the town, has disappeared, so as now to be little known; and it is thought that the copper-smoke greatly counteracts the injurious effects to health which would otherwise arise from the neglected sewerage, drainage, and scavenging of the town.

Mr. Bevan, surgeon and registrar of Swansea, who considers "the counteracting agency of copper-smoke, as eminently useful in destroying miasmata, and consequently in the prevention of fevers, agues, &c.," after pointing out the advantageous situation of the town, says—

"The general state, however, of the drainage and scavenging is undeniably bad, and nothing less than its happy locality and temperature prevent the worst effects to the general health ensuing. The town sewerage is not only extremely partial, inasmuch as not only many districts built within the last four years have no public sewers, but also from alterations made in several of the older ones, the leading sewers have had their fall or level altered, the result of which is their total inadequacy to the purposes for which they were intended. The greater number of cases of fever which I have met with in the course of my practice have occurred in the districts in which no provision has been made for drainage. This is proved by the classification of the deaths in the following table:—

CLASSIFICATION of DEATHS at Swansea for the Years 1839 to 1842.

High-street . . . . .	93
Strand . . . . .	108
Green Hill and Upper District . . . . .	524
Middle District . . . . .	342
Burrows . . . . .	23
Mount Pleasant . . . . .	19
Upper Suburbs . . . . .	62
Sketty . . . . .	36
Hamlet of St. Thomas . . . . .	38
Deaths occurring in obscure parts not included in the above Districts. . . . .	33

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"From this it appears that the greatest proportion of deaths in the several years has taken place in the Strand, Green Hill, and Middle districts, the very situations in which there exists no sewerage, and in which three out of four have been fever and inflammatory cases. The comparison



between these districts and others inhabited by the same class has, with due regard to the proportion of the population, occupied my attention, and the result has been a conviction of the evils arising from the want of a proper system of drainage, sewerage, and cleansing."

The annexed table, constructed from the returns of the Mortuary Registers, affords a general view of the mortality within the Swansea district, from 1839 to 1843, both inclusive (five years), in which those who have died of decline, consumption, and of epidemic, endemic, and contagious diseases are especially enumerated, with their ages at death, the whole divided into the three classes of gentry, tradespeople, and artisans and labourers.

No. 2.—DEATHS in SWANSEA for Five Years, ending 1843, stating the Rank in Life and Mean Age at Death; and distinguishing Deaths by Decline, Consumption, and Epidemic Diseases.

Population, 1841—18,278.		Total Deaths from all Causes during 5 Years.	Mean age at Death.	Decline.		Consumption.		Epidemics.	
				Number of Deaths.	Mean Age.	Number of Deaths.	Mean Age.	Number of Deaths.	Mean Age.
MALES.									
Gentry	Under 5 Years	3	..	..	..	..	..	..	..
	Above 5 Years	25	44	3	..	3	..	2	..
	Of all Ages	28	39	3	33	3	28	2	25
Tradespeople	Under 5 Years	42	..	..	..	..	..	9	..
	Above 5 years	94	43	27	..	4	..	13	..
	Of all Ages	136	30	27	41	4	24	22	12
Labourers and Artisans	Under 5 Years	285	..	8	..	1	..	106	..
	Above 5 Years	367	37	117	..	25	..	60	..
	Of all Ages.	652	22	125	34	26	31	166	9
FEMALES.									
Gentry	Under 5 Years	..	..	..	..	..	..	..	..
	Above 5 Years	18	44	8	..	2	..	2	..
	Of all Ages	18	46	8	41	2	25	2	28
Tradespeople	Under 5 Years	24	..	1	..	..	..	8	..
	Above 5 Years	80	43	21	..	6	..	9	..
	Of all Ages	104	34	22	36	6	25	17	12
Labourers and Artisans	Under 5 Years	259	..	12	..	..	..	106	..
	Above 5 Years	397	45	102	..	9	..	74	..
	Of all Ages	656	28	114	34	9	30	180	11

From this table it appears that, taking the population of the district at 18,278, according to the census of 1841, the middle of the five years noticed, the rate of mortality is 1.74 per cent.; \* that the average

\* Mr. J. H. Vivian, in his Statistics of the Swansea Union, obtains 1.69 for the Swansea Town District, from the following data; 1.79 being given for the Llan-gafelach District, while the rural districts of Gower and Llandilo-Talybont are respectively 1.45 and 1.41, the mean for the whole Union being 1.64.

number of male deaths per annum is 163·2, and of female deaths 155·6, or 7·6 less than the male; and that this difference in the number of male and female deaths is due to the fewer females who die among the gentry and tradespeople relatively to the males, than among the artisans and labourers, the deaths among whom are nearly even as regards the sexes, for the five years.

It will be seen that the mean age of the gentry who died in the five years was, for the males 39, and for the females 46 years; the mean age of the tradespeople, for the males 30, for the females 34 years; the mean age of the labourers and artisans, for the males 22, for the females 28 years: in all the three classes, showing a higher age at death for the females than the males—in the first class, of seven years; in the second, of four years; and in the third, of six years: so that this difference is less observable among the tradespeople than among the gentry, and artisans and labourers. The total mean age of the males who died was 23 years, and of the females 29 years.

It will be observed that, as usual, the numbers who die under five years of age are considerable, being 1 in 2·6, the mean age for whom, both males and females, being one year. The mortality of this kind is, however, very different in the three different classes, being, for the gentry, only at the rate of 1 in 15·3 of the total deaths, while for the tradespeople it is 1 in 3·6, and for the artisans and labourers 1 in 2·4; results strongly marking the difference of the sanitary conditions under which the children of the three classes must be placed.

Abstracting those who die under five years of age, the annexed table shows that the mean age at death is for the male gentry 44, and for the female gentry the same; for the male tradespeople 43, and for the females of the same class the same; while for the male artisans and labourers the mean age is 37, and for the females 45 years, an age for the latter higher than that of the other two classes, though it does not materially differ from them, and one eight years above that for the males of the same class; appearing to show that the influences to which the males of this class have been exposed were much more injurious to life than those which have acted on the females.

According to the table, 1 in 5 die of decline, the deaths from this cause being slightly less among the gentry than among the two other

PROPORTION OF BIRTHS AND DEATHS in the SWANSEA UNION per Cent. to POPULATION, in the four Quarters ending March, 1842, and 1843; calculated on the Returns from the Registrar's Office at Swansea.

		Population.		Births.			Deaths.		
		Census, 1842.	Com- puted, 1843.	Year ending March, 1842.	Year ending March, 1843.	Mean.	Year ending March, 1842.	Year ending March, 1843.	Mean.
In the Gower District . . .	No. 1	6,490	6,584	1·65	1·62	1·63	1·16	1·75	1·45
In the Town District . . .	No. 2	18,278	18,681	2·61	2·81	2·71	1·58	1·80	1·69
In the Llangafelach District . . .	No. 3	9,001	9,182	3·62	3·87	3·74	1·84	1·75	1·79
In the Llandilo-Talybont Dis- trict. . . . .	No. 4	4,880	4,946	2·70	2·71	2·70	1·58	1·25	1·41
		38,649	39,393	2·70	2·85	2·77	1·57	1·71	1·64



classes, and 1 in 22·4 of the total deaths were from consumption, this cause of death being most prevalent among the gentry, 1 in 9·2 of whom thus died in the five years, while the rate of death from this cause appears for the tradespeople 1 in 24, and for the artisans and labourers 1 in 22·4. By taking decline and consumption together, 1 in 4·6 of the total deaths are from these causes, it appearing under the head of decline and of consumption that more males than females thus died; the mean age of both sexes for the class of artisans being the same (34 years) for decline, and nearly the same (31 and 30) for consumption. The mean age of the gentry for decline is 33 for males, 41 for females; and for consumption 28 and 25. For tradespeople the mean age for deaths by decline is 27 males and 22 females, and for consumption 24 and 25.

With respect to epidemics, endemics, and contagious diseases, it would appear that 1 in 4 of the total deaths is from these causes; 1 death in 11·5 among the gentry being from them, among the tradespeople 1 in 6, and among the artisans and labourers 1 in 3·5.

The rate of mortality for Swansea being so low, while the proportion of the total deaths from decline, consumption, and epidemic, endemic, and contagious diseases is so considerable, it becomes desirable to seek for a cause for this apparent contradiction; and such seems to present itself in the number of persons, above the age of five years, who resort to Swansea for employment, lowering the rate of mortality as regards the population, from being above those ages at which death is most frequent.

Mr. J. H. Vivian, in his *Statistics of the Swansea Union*, one which comprises 27 parishes, and had in 1841 a population of 38,649, observes, while he notices the probable neglect in registering the births, "that the increase in the population of the Union, taking the excess of births beyond deaths, would be 442 persons, or about 1·14 per cent. per annum, on the average of the years ended March 1842 and 1843. Whereas, on the average of the 10 years ending 1841, the increase was 744 persons, or 1·92 per cent.; so that if the returns of births and deaths are correct, 302 persons must come annually to reside within the Union from other parts of the county or of the kingdom.\*

From the following table, given by Mr. Vivian, it would appear that, at the time of the census of 1841, somewhat more than one-third of the population of Swansea town and franchise were not born in the county in which Swansea is situate, and even in Swansea hundred less than 1 in 8 were not so born. The table will also illustrate the increase of the population during 40 years, from 6099, in 1801, to 16,787 in 1841, one that may be mainly attributed to the increase of the copper-works, to the working and export of coal during that time, and to the influx of strangers to supply the increased demand for labour and other consequent occupations.

Extracts from the *Population Returns* :—

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\* *Statistics of the Swansea Union*, 1844, p. 31.

## SWANSEA TOWN AND FRANCHISE.

	Houses.				Persons.			Occupations.		
	Inhabited.	By how many Families.	Uninhabited.	Building.	Males.	Females.	Total of Persons.	Families chiefly employed in Agriculture.	Families chiefly employed in Trade, Manufactures, or Handicraft.	All other Families not comprised in the two preceding Classes.
1801	1,182	1,504	21	..	2,529	3,570	6,099	39	1,196	4,864
1811	1,591	1,843	104	7	3,704	4,492	8,196	11	1,625	207
1821	2,049	2,124	84	30	4,541	5,714	10,255	30	739	1,355
1831	2,582	2,872	132	24	5,891	7,365	13,256	33	1,289	1,633
1841	3,166	..	139	64	7,861	8,926	16,787	..	..	..

## SWANSEA HUNDRED.

1801	1,620	1,701	97	..	3,366	4,019	7,385	2,452	562	5,660
1811	1,817	1,900	67	15	3,630	4,627	8,257	4,627	956	453
1821	1,890	2,004	95	16	4,484	5,017	9,501	981	528	495
1831	2,241	2,335	110	33	5,361	5,876	11,147	971	465	816
1841	2,686	..	214	30	6,418	6,904	13,322	..	..	..

		Ages.		Ages.		Persons Born.	
		Under 20 Years of Age.		20 Years and upwards.		In this County.	Elsewhere.
		Males.	Females.	Males.	Females.		
1841	Swansea Town and Franchise	3,590	3,776	4,271	5,150	11,093	5,694
	Swansea Hundred. . . .	3,214	3,296	3,204	3,608	11,786	1,536

NOTE.—These numbers refer to persons. In the other years to families.

Having thus obtained an explanation tending to show how the apparently low rate of mortality might be accounted for, it became desirable to compare the town with the adjacent country, and with other districts in South Wales, in order to see how far the climate, nearly common to them all, might be supposed to influence the deaths by decline and consumption, as has been stated to be the case, and therefore to see how far the influence of the copper-smoke might be fairly charged with some parts of the results, the modes of life of the general population being much the same throughout.

For this purpose, and in order to test the value of climate, the following table from documents prepared at the office of the Registrar-General has been constructed. The districts of Penzance, Truro, Tavistock, and Barnstaple being selected as offering somewhat similar climates in the south-west of England; and Kendal for the same reason, more particularly as regards the prevalence of moisture, in the north-west of England. Yarmouth and Whitby were taken as points on the eastern coast of England; Beverley and Ipswich as others more inland on the eastern part of the island; and Huntingdon as having a more central position. In most of the localities the districts comprise rural portions, a circumstance useful as regards investigation into the influence of climate.



	Total.	One in (of Popu- lation.)	One in Total Deaths.
<b>PENZANCE.</b> —(Population, 50,100.)			
Total deaths . . . . .	4,727	11	..
Deaths from Epidemic, Endemic, and Conta- gious diseases, including Typhus . . . . .	1,059	47	4·4
Deaths from Typhus . . . . .	173	290	27·3
Deaths from Consumption . . . . .	843	59	5·6
<b>TRURO.</b> —(Population, 43,137.)			
Total Deaths . . . . .	4,288	10	..
Deaths from Epidemic diseases, &c. . . . .	881	49	4·8
Deaths from Typhus . . . . .	160	270	26·8
Deaths from Consumption . . . . .	845	51	5
<b>TAVISTOCK.</b> —(Population, 23,995.)			
Total deaths . . . . .	2,134	11	..
Deaths from Epidemic diseases, &c. . . . .	520	46	4
Deaths from Typhus . . . . .	145	165	12·6
Deaths from Consumption . . . . .	333	72	6·4
<b>BARNSTAPLE.</b> —(Population, 37,452.)			
Total deaths . . . . .	2,792	13	..
Deaths from Epidemic diseases, &c. . . . .	485	77	5·7
Deaths from Typhus . . . . .	116	323	24
Deaths from Consumption . . . . .	488	77	5·7
<b>HUNTINGDON, ST. IVES, and ST. NEOTS.</b> (Population, 55,573.)			
Total deaths . . . . .	5,852	9	..
Deaths from Epidemic diseases, &c. . . . .	1,103	50	5·3
Deaths from Typhus . . . . .	343	162	17
Deaths from Consumption . . . . .	1,107	50	5·3
<b>KENDAL.</b> —(Population, 34,694.)			
Total deaths . . . . .	3,677	9	..
Deaths from Epidemic diseases, &c. . . . .	750	46	4·9
Deaths from Typhus . . . . .	204	170	18
Deaths from Consumption . . . . .	662	52	5·5
<b>YARMOUTH.</b> —(Population, 24,031.)			
Total deaths . . . . .	2,370	10	..
Deaths from Epidemic diseases &c. . . . .	359	67	6·6
Deaths from Typhus . . . . .	56	429	42
Deaths from Consumption . . . . .	315	76	7·5
<b>IPSWICH.</b> —(Population, 25,254.)			
Total deaths . . . . .	3,010	8	..
Deaths from Epidemic diseases, &c. . . . .	562	45	5·3
Deaths from Typhus . . . . .	93	272	32·3
Deaths from Consumption . . . . .	685	37	4·4
<b>BEVERLEY.</b> —(Population, 18,957.)			
Total deaths . . . . .	1,867	10	..
Deaths from Epidemic diseases, &c. . . . .	364	52	5
Deaths from Typhus . . . . .	61	311	30·6
Deaths from Consumption . . . . .	205	92	9
<b>WHITBY.</b> —(Population, 20,100.)			
Total deaths . . . . .	2,148	9	..
Deaths from Epidemic diseases, &c. . . . .	316	64	6·8
Deaths from Typhus . . . . .	49	410	48
Deaths from Consumption . . . . .	287	70	7·5

From this table it will be seen that the rate of death by consumption (decline being coupled with it in these returns) is as high, or nearly so, at Carmarthen as at Swansea, and not materially different at Truro; so that though Llanelly with its copper-works is included in the Carmarthen district, yet we cannot refer the prevalence of consumption at Truro, its tin-smelting works not evolving much noxious vapours, to the mixture of the same gases with the atmosphere as are discharged at the copper-works. Moreover, at Ipswich we find a still higher rate for consumption than at Swansea, and at Ipswich the only works of importance seem to be iron-founderies. The Cardiff district, which includes Neath and Tybach with their copper-works, affords a far lower rate of death by consumption, one approximating to that observable at Yarmouth and Whitby. Regarding climate, the Cardiff district is much drier than those of Swansea, Carmarthen, and Haverfordwest, the mountains on the north of it carrying off the clouds drifted from the Atlantic. Still it seems difficult from the data here assembled to conclude much as to the supposed influence of climate on the west coast of England and Wales in aiding the prevalence of consumption, although Beverley, Whitby, and Yarmouth appear such favourable positions in the table; for Ipswich is the worst of all the places enumerated, and Huntingdon is about equal to Kendal, Truro, Haverfordwest, and Penzance. Should such an influence exist, it will require to be proved by more satisfactory data than are here assembled.

District.	Population in 1841.	Average Deaths perAnnum.	Per Centage of Deaths.	Deaths by Consump- tion.	Deaths by Typhus.	Deaths by Epidemics, including Typhus.	Deaths from other Causes than Epidemics and Consump- tion.
Swansea . .	38,641	672	1.7	1 in 4.8	1 in 11.0	1 in 3.5	1 in 1.9
Cardiff, &c. .	86,536	1,746	2.0	7.0	11.6	3.8	1.7
Caermarthen .	37,512	737	1.9	4.9	13.0	4.3	2.0
Haverfordwest .	37,139	669	1.8	5.5	16.7	4.6	1.8
Penzance . .	50,100	945	1.9	5.6	27.3	4.4	1.7
Truro . . .	43,137	858	2.0	5.0	26.8	4.8	1.7
Tavistock . .	23,995	427	1.8	6.4	12.6	4.0	1.7
Barnstaple . .	37,452	558	1.5	5.7	24.0	5.7	1.5
Kendal . . .	34,694	735	2.1	5.5	18.0	4.9	1.6
Huntingdon, &c.	55,573	1,170	2.1	5.3	17.0	5.3	1.6
Yarmouth . .	24,031	474	2.0	7.5	42.0	6.6	1.4
Ipswich . . .	25,254	602	2.4	4.4	32.3	5.3	1.7
Beverley . . .	18,957	373	2.0	9.0	30.6	5.0	1.4
Whitby . . .	20,100	430	2.1	7.5	47.9	6.8	1.4

This table shows that both consumption and typhus are prevalent in the Swansea district, and it would appear that in 1842, at Morristown (more frequently involved in copper-smoke than Swansea), 12 deaths in 42, or 1 in 3.5, were from consumption. The proportion of deaths by typhus in the Swansea district is very considerable, the largest in



the list, though Cardiff nearly approaches it. While 1 in 11 of the total deaths is from typhus at Swansea, only 1 in 47·9 so die at Whitby, and 1 in 42 at Yarmouth; even Ipswich, apparently so high for consumption, gives only 1 in 32·3 for typhus. After Cardiff, Tavistock and Carmarthen come the nearest to Swansea. For deaths by epidemics generally, and including typhus, the rate of mortality at Swansea is high, closely followed by Cardiff; so that the supposed corrective influence of the copper-smoke for these diseases is not apparent. It would thus appear that, as regards the health and average age of the inhabitants, the low rate of 1·74 as the per centage of death in the population may be much influenced by the influx of persons above 5 years of age, so that the real per centage of the deaths of those born at Swansea may be much the same as for similar towns; that notwithstanding this immigration, the comparative number who die before 5 years of age is still considerable; that there is a marked difference in the relative amount of deaths before 5 years between the richer and poorer persons, being 1 in 2·4 of the total deaths for the latter; and that a large proportion of deaths is from decline, consumption, and epidemics, including typhus.

The influence of climate, and of the copper-smoke, though such influence can scarcely be doubted, is not very clearly seen from known data. Taking two rural districts of the Swansea Union, both to the westward of, and therefore scarcely affected by, the copper-smoke, namely Gower and Llandilo Talybont, but still under the influence of the same general climate, we find that, with a united population of between 11,300 and 11,500 persons; the per centage of death is 1·43. The Llangafelech and town districts show a higher rate of mortality, and are those in which this should be expected from the occupations of the inhabitants, and the impurities from various causes, mingled with the air breathed.

Though there is no over-crowding in Swansea, the subject being viewed as a whole, yet from the little attention paid to the ventilation of their rooms, especially their sleeping-rooms, by the mass of the poorer classes (an inattention common to the surrounding districts), and from the defective drainage of the town, conditions favourable for epidemics exist, and 1 in 3·5 of the total deaths among artisans and labourers is from this cause in the Swansea district. Notwithstanding the influence of the rural districts, the same rate for epidemics obtains in the whole Union comprising a population of 38·641.

Consumption (including decline) is also a marked cause of death, 1 in 4·6 in the town district thus dying, a proportion differing but little from that for the whole Union, namely, 1 in 4·8.

The employment of the poorer classes is, as a whole, good, a fact indeed proved by the immigration from other places and parts of the country; and those engaged in the copper-works, more especially, enjoy the benefits of a fair diet, so that with respect to food the poorer classes of Swansea cannot be regarded as deficient.

As respects the average age at death, in a town in which about one-third of the population was not even born in the county of Glamorgan, and who have therefore immigrated into the district, the population so moving in being probably, as a whole, of fair age, little conclusion can be drawn, except that this circumstance would tend to raise the appa-

rent health and longevity in the district beyond a just comparison with other districts and towns not under equal conditions.

## REPORT *on the* SANATORY CONDITION *of* MERTHYR TYDFIL, GLAMORGANSHIRE.

BY SIR H. T. DE LA BECHE.

*Situation.*—Merthyr Tydfil, including under that name the town properly so called, Dowlais, and Pen-y-Daran, occupies a length, not including the houses connected with the Plymouth Iron-works, of about two miles, partly in the valley of the Taffe and partly in that of its tributary the Morlais. Taken as a whole, it may be considered well situated on sloping ground, a very small portion having a level character. Merthyr church is stated to be 500 feet above the docks at Cardiff, and Dowlais is about 400 or 500 feet above it—Pen-y-Daran being situated between the two places, and joining them together. The valley of the Taffe extends to the range of the Vans of Brecon (2862 feet), where the river has its source, and becomes more expanded near Merthyr Tydfil than further down, the northern escarpments of the mountains, containing coal and iron, ranging off from the main valley near the town. Hence the situation of Merthyr is open, airy, and well exposed to the sun.

*Climate.*—As might be expected from the elevation of the town, varying from about 500 to 1000 feet above the sea, the temperature is somewhat low compared with that at Swansea, and other places on the coast, or at much lower levels, in the vicinity. At the same time the district around the town is rainy and damp, as a whole, the high lands collecting the vapours brought by the prevalent winds from the sea. It does not appear that any register of the temperature experienced, or of the fall of rain, has been kept at Merthyr. Though so many iron-furnaces are in blast (there are 18 at the Dowlais establishment alone,) with all their accessory fires and works, and with a population amounting to 37,264, Merthyr Tydfil is not a smoky town, the coals employed either at the works or for domestic use being of a quality so approximating towards anthracite as to emit little smoke, and coke being used when required in the iron-works.

*Geological Character of the Ground.*—The rocks on which the town stands form that interstratification of coal-beds, shales, sandstones, and conglomerates known as the Coal Measures, to which, in this district, and for a long line of country, are added beds of clay ironstones. To these ironstones, to the coal, and to the proximity of limestone, employed as a flux in smelting the iron, Merthyr Tydfil owes its importance in the manufacture of iron.

These beds are much covered by gravel in some localities, especially in the lower parts of the valley, and through the gravels the waters percolate in the low grounds, and are obtained in wells. Many beds of the coal measures also throw out springs, or offer facilities for procuring the water sustained by them when wells are sunk to such beds; so that if careful arrangements were made, the inhabitants might receive a good



supply of water, one which would but little interfere with that required for the works.

Neither the surface of the ground nor its geological structure present difficulties for a proper drainage of the town; on the contrary, they would offer great facilities.

*Drainage and Cleansing.*—In these respects this town is in a sad state of neglect; with the exception of some little care in the main streets, and regulations about removing ashes before the doors in Dow-lais, all else is in a miserable condition. From the poorer inhabitants, who constitute the mass of the population, throwing all slops and refuse into the nearest open gutter before their houses, from the impeded courses of such channels, and the scarcity of privies, some parts of the town are complete networks of filth, emitting noxious exhalations. Fortunately the fall of the ground is commonly so good that heavy rains carry away much of this filth. There is no local Act for drainage and cleansing, the Highway Act being that in force, and the chief lines of road appearing to be under the Commissioners of the Turn-pikes. During the rapid increase of this town, no attention seems to have been paid to its drainage, and the streets and houses have been built at random, as it suited the views of those who speculated in them.

Mr. James, chairman to the Board of Guardians, in his answers to the questions of the Commissioners, observes that there are no regulations for draining the town; (6) that the streets are not properly laid out for the discharge of surface moisture; that surface moisture is retained; that there are accumulations of refuse thrown from the houses; and that there are stagnant pools and ditches contiguous to the dwellings.

7. "There are very few drains, and, with one or two exceptions, very inefficient."

8. "The great majority of houses have not proper necessities; some are arranged to empty into drains or cesspools, but the majority are not, and are cleansed by the nightman."

9. "The house-drains are not efficiently cleansed."

10. "The very few public sewers are constructed as badly as possible."

11. (Regulations in force for drainage) "None."

12. (The liquid refuse is) "thrown into the water-courses."

14. (The public sewers cleansed) "by showers of rain only."

15. "The main streets are occasionally cleansed by the Turnpike Trust Commissioners."

16. (Courts and alleys inhabited by poorer classes cleansed.) "No."

17. "No dust-bins."

18. (Deposit of town refuse.) "Waste pieces of ground near to different parts of the town, and the beds of the rivers Taffe and Morlais; and after a long draught, as at present (July 1844), the stench is almost intolerable in many places. It is not sold as manure."

19. (Local power for enforcement of cleansing.) "None."

Mr. Russell, attorney at Merthyr, states, respecting the drainage and cleansing—

6. "There is no general drainage; but nature does much, as the town is situated on the side of a hill."

7. "There is but one sewer in a new street, but the houses generally in that street do not communicate with it. Drainage is altogether defective."

8. "No place can be worse provided with these conveniencies (necessaries for the houses), there being scarcely any attached to the cottages, which bear the greatest proportion (to the other houses). There are no public ones."

9. "The houses are not properly drained, and are offensive generally."

11. (Local regulations.) "None."

12. (Liquid refuse) "allowed to remain on the surface."

14. "There are no public sewers."

15. (Cleansing.) "Only on the turnpike and parish roads."

16. (Courts and alleys inhabited by poorer classes cleansed.) "No."

18. (Deposit of refuse.) "The river Taffe generally; but this is little attended to by the inhabitants. None sold as manure."

Mr. Davies, landlord of the Bush Inn, who has known the town for 20 years, states, in answer to the same questions—

5. "No public survey (of the town)."

6. "No regulations (for drainage). The streets are uneven and unpaved, and retain stagnant waters, as also refuse thrown out from the houses. Many cellars or kitchens are used for slaughtering cattle."

7. (Arrangements for under-drainage) "very defective. No sewers or branch drains."

8. (Proper necessities for houses.) "No. The accumulation of filth is sometimes removed, about once in five years. No public necessities."

9. "Very few drains. The refuse is allowed to accumulate, and too often emit offensive smells."

10. "No public sewers. There is a culvert made by private individuals, and only for the use of certain houses."

11. (Regulations in force for systematic drainage.) "No regulations."

12. (Liquid refuse.) "Thrown into the water-courses. Too often allowed to soak into the subsoil, and in warm weather proves offensive, and detrimental to the health of the inhabitants."

14. (Sewers cleansed.) "No."

16. "No appointed scavengers. The refuse is removed according to the habits and convenience of the inhabitants."

17. "No dust-bins. Soil and rubbish are thrown in various parts of the town upon waste lands."

18. (Place of deposit for refuse.) "No regular place."

19. (Local authority for enforcement of cleansing and prevention of nuisances.) "None, except on parish roads and thoroughfares."

The evidence of Mr. James and Mr. Martin, surgeons, upon the same subject is as follows:—

6. "No regulations. No attention ever paid to drainage, except for a few yards, nearly opposite the church; that, however, had no influence in draining the road, but the contrary, as it rose up into the side of the road about 60 yards from the water-course that it runs to." *J.*

6. "There are no regulations for drainage. The streets and roads are badly constructed, and with respect to pavements they are wretched. There are stagnant pools adjoining the town." *M.*

7. (Sewers.) "None but the one just mentioned till lately, when a drain has been carried through the Market Field to the river. There is also a drain from George Town, but I should suppose the fall is too little. It ought to be put under the canal. Nothing but an Act of Parliament can do it, and it is much wanted." *J.*

7. "We have a few sewers: I believe they are very imperfect." *M.*

8. (Proper necessities to the houses.) "No place can be worse off in this respect. Scores, I dare say, hundreds of houses have no such convenience as a necessary." *J.*



8. (Some) "houses in the town have necessaries, but no drains. There are no public necessaries." *M.*
9. "Such a thing as a house-drain was never heard of here." *J.*
9. "The refuse often accumulates so that the smell is most offensive." *M.*
10. "The only sewer I know of is by the Globe tavern, and goes under the road. There is an open grating to it, to let in the water from the road. This emits a very offensive effluvium at times." *J.*
10. "The public sewers are badly formed, so that they deposit large quantities of refuse. It remains there until washed away by the rain." *M.*
11. (Local regulations for drainage.) "No." *J.*
11. "There are no local regulations for that purpose." *M.*
12. (Liquid refuse.) "Thrown on the ashes frequently. Often out of the door, there to soak until the rains carry it away." *J.*
12. "Some thrown into the river, the remainder allowed to accumulate on the surface." *M.*
14. (Cleansing of sewers.) "They are not cleansed, except by rain water." *M.*
15. "The surveyor of the (turnpike) road employs men and a cart to clear away the dirt." *J.*
15. "We have no scavengers." *M.*
16. "Nothing removed from them (courts and alleys) at the public expense." *J.*
16. "I believe they are seldom cleansed." *M.*
17. (Dust-bins) "Not known here." *J.*
17. "The houses are not provided with dust-bins." *M.*
18. (Deposit of refuse.) "Any vacant place. The iron-masters generally cart it away. Nothing paid for it, or for removing it." *J.*
18. "Most of it is deposited by the river-side, to be carried away by the floods. I think very little of it is sold as manure." *M.*

Though abundant other evidence might be adduced, the above will be sufficient to confirm the statement of the singularly neglected state of Merthyr as to drainage and cleansing. Some apparent difference in the evidence arises from applying the term sewer to common drains for surface water. Of the former the private sewer mentioned is the chief, if not the only one, deserving the name.

It would appear that the Dowlais Iron Company undertake to carry away the ashes from the doors of the inhabitants of Dowlais at the rate of one penny per week for each house. This money seems stopped out of the wages paid, the greater part of the population of Dowlais being under the control, and in the pay of the Company.

The rarities of privies is one of the marked characteristics of the town. Even many recently erected houses are unprovided in this respect, though more attention is now paid than formerly to such conveniences. In some localities, a privy was found common to 40 or 50 persons, and even up to 100 persons and more, and from its neglected state, it might well be doubted if it were of advantage, further than to conceal the inhabitants frequenting it from view. Even the houses of small but respectable tradespeople were found unprovided in this respect at Dowlais, and in consequence, the females of the families were put to much inconvenience.

From the number of persons congregated together, and the scarcity of privies, not much regard to decency is paid by the mass of poorer persons, though some of the women are described as suffering much from constipation, brought on by their attempts to avoid exposure.

The cinder-heaps, as the lines of refuse slags from the iron-works are termed, and the river-sides are frequented by persons of all ages and sexes, who manage the best way they can. This system produces much indifference to personal exposure, and may in some way account for the not uncommon practice of the workmen, on their return home from their labour, stripping, and being washed and rubbed down, while naked, by the females of the house, or who may be in it at the time, usually, as it is stated, without much regard to their being married or unmarried. Notwithstanding such exposure and practices, however, the inhabitants of Merthyr are stated by competent and highly credible witnesses to be no more immoral than the inhabitants of other towns in South Wales, and to be not at all remarkable for freedom of intercourse among the sexes.

As an illustration of the habits of the poorer classes, it may be stated, from the information of the clergyman of Dowlais, that when the schools at Dowlais were first built, holding 150 boys, and 150 girls, the children did not know how to make use of the privies, and were obliged to be taught.

The practice of throwing the refuse and slops immediately in front of their doors is not uncommon with the poorer classes in this part of the country; and it is curious to observe the force of this habit, even in those who in the interior of their houses preserve the utmost neatness. Instances of this kind are common in Merthyr Tydfil, for in many localities the interiors of their houses are cleanly and well kept. It has been seen that such is the practice at Brecon; and when noticed in small towns or villages, does not so forcibly strike the observer, nor is it then, perhaps, so mischievous from the small number of houses; but when the same practice is carried into a town, containing many thousands of inhabitants, and wherein there is no system of public sewerage, or any proper control over nuisances of this order, the evil is manifest.

*Supply of Water.*—There is no public supply of water, and the only thing approaching to it seems a pipe carrying water from a spring, to spouts used by some of the Pen y Daran houses, and a spout or two at Dowlais. There are great complaints as to the arrangements for water, and the poorer classes are ill supplied, more especially in dry weather. Pumps and wells are the chief sources, whence that for domestic use is obtained, and the inhabitants commonly term it good; but it may be reasonably doubted, as most of these wells are fed by surface-waters, if it can be free from a mixture with impurities derived from the house refuse, soaking into the ground in all directions.

The evidence of Mr. James (Chairman of the Board of Guardians), Mr. Russell, Mr. James (surgeon), Mr. Martin, and Mr. Davies, on this head, is as follows:—

They all point out that the supply is from the river and surface springs and wells, or the overflow of the canal, and that there is no public distribution of water.

32. (Supply of the poorer classes.) “The poorer classes are supplied with water from the different pumps and draw-wells attached to their houses, and in many instances obtain it from the pumps belonging to the tradespeople. I have never heard of more than one instance where a person charged for water from his pump.” *J. ch.*

32. “In all these modes” (pumps, wells, and begging from tradespeople).



32. "In very dry weather the supply is very scanty, as several pumps become dry, and the small rivulets running out of the fields are nearly dry. I often see above a dozen waiting to get their vessels filled. My own neighbourhood is badly off. About three years ago I had a well sunk, and upwards of 20 families are supplied with as much as they choose, at 1s. 6d. per quarter. I suppose they find it advantageous, as the same parties continue to take it, and dread the refusal of it." *J. s.*

32. "The poorer classes are supplied from pumps and draw-wells: in dry seasons they are obliged to beg from the tradespeople." *M.*

32. "From tradespeople and other sources." *D.*

33. "Great and well-founded complaints as to quantity, more especially at Dowlais, where the want of water is frequently distressing." *J. ch.*

33. "In unusual dry weather, the poor, in many instances, carry their water from a long distance. At others, have to wait the greater part of the night at pipes (spouts). The usual charge for carrying is from 4d. to 6d. a barrel." *R.*

33. "Great complaints." *D.*

34. (Charge for water). "From private pumps 6d. per quarter." *D.*

38. (Filters in use). "I believe there are half-a-dozen in the town." *M.*

38. "Very rarely." *D.*

44. (Fires). "One in seven or ten years." *J. ch.*

44. "Not one a-year, very little timber being used in the buildings." *R.*

44. "A fire at Merthyr is a very rare circumstance. Not one in two or three years; which is very extraordinary, considering that fire is kept in many houses all night. Many of the iron-miners have pounds of powder, and generally kept under the bed." *J. s.*

46. (Fire-engines and firemen). "No." *J. ch.*

As observed by Mr. James, the complaints for water at Dowlais appear greater than at Merthyr. In dry weather, the poorer classes appear to go even to the distance of nearly a mile, waiting through a great part of the night, from the numbers that flock to the same spot. It was stated that the Dowlais Company have had the ground surveyed for the purpose of affording a supply from springs at high levels, but hitherto nothing further has been done. The Brewhouse spring seems much frequented by the inhabitants of Lower Dowlais; but they are described as waiting three or four hours for their turn to come round. There is a well at Merthyr, known as Richard Jones's well, frequented by persons from 7 to 9 A.M., and from 3 to 5 P.M., who pay 6d. per quarter for the water. In some parts of Merthyr a pump is found, belonging to several houses, the property of one person (a privy may also be added); but so little care is taken of the surface-drainage that impurities must often get mingled with the waters of these wells.

*Houses of the Poorer Classes.*—The great proportion of the houses in Merthyr is occupied by those who are employed in the iron-works, either in smelting the iron itself, in the subsequent processes, or in procuring the necessary coal and ironstone. The various superintendents and tradespeople occupy better houses, and the few of a superior kind are tenanted by professional men, while Cyfartha Castle, Dowlais House, Pen y daran House, and the residence at the Plymouth works, are occupied by the heads of the four iron-establishments. The best of the workmen's houses are, for the most part, those erected by the different iron-companies, for such as labour in connexion with their establishments. Some of these appear to have been sold, especially at Dowlais. Speculators of various kinds seem to have built courts, alleys, and rows of houses, wherever opportunities presented themselves,

in order to meet the demand for the rapid increase of the town, entirely without regard to any order or system, and without any control as to lines, the form of streets, or to arrangements for drainage. The result is, as might be expected, a very straggling town, the chief roads or thoroughfares governing the main direction of the houses. In the new buildings at Dowlais, and 600 cottages are stated to have been erected there within the last eight years, more attention has been paid to system, and well-contrived streets as regards plan have been built; so that the old and newer parts of Dowlais differ in appearance, the other portions more resembling the generality of houses in Merthyr Tydfil, properly so called.

A large number of these cottages consist of only two rooms, the upper being the sleeping-apartment for the family, and usually ill-ventilated. Mr. Davies, superintendent of the Merthyr police, states, that in these two-roomed houses, occupied by workmen, there are generally three beds in the sleeping-apartment, containing five or six persons. These cottages are often very small, 8 feet by 10 feet and 8 feet by 12 feet, being not uncommon. Some are of less dimensions. The average rent of these houses is about 6s. per month (of four weeks), or 3*l.* 18s. per annum,—a high rent, apparently, for such tenements. The rents of houses of this class were found somewhat higher in parts of Dowlais, rising up to 8s. per month, or 5*l.* 4s. per annum.

Another kind of cottage, of a better kind, consisting of a kitchen, pantry, and sleeping-room on the ground-floor, and two sleeping-rooms above, is not uncommon, the rent for which varies from 8s. to 12s., and 13s. per month, or from 5*l.* 4s. to 7*l.* 16s. and 8*l.* 9s. per annum. The proportion that these rents bear to the wages of the workmen may be estimated by the following rates of pay, stated to be about the average at present received:—

Colliers . . . . .	17s. per week
Miners . . . . .	14s. „
Labourers . . . . .	12s. „
Masons . . . . .	14s. „
Firemen . . . . .	} 20s. „
Puddlers, &c. . . . .	

The most wretched part of the town would appear to be that known as the Cellars, near Pont Storehouse, and supposed to contain about 1500 persons. Though so named, they are not cellars, but a collection of small houses of two stories, situated in a depression between a line of road and a cinder-heap, a line of slags from the furnaces, the lower portion of this collection abutting upon the river Taffe. The space between these houses is generally very limited; and an open, stinking, and nearly stagnant gutter, into which the house-refuse is, as usual, flung, moves slowly before the doors. It is a labyrinth of miserable tenements and filth, filled with people, many of whom bear the worst characters. The rents of these houses seem to vary from 3s. to 5s. per month. One house was found to measure 10 feet by 5 feet, and 6 feet high in the lower room; and 10 feet by 5 feet, 5 feet high in one place, sloping to 1 foot 6 inches opposite, in the upper room. There was a tenement of only one room, 7 feet by 4 feet 6 inches, 5 feet 3 inches high, with a bed in it, and a stinking gutter partly under the floor.



The generality of the houses are, however, of larger dimensions. An end of one of the narrow courts is used as an open necessary by many of the inhabitants, thus causing an intolerable nuisance.

At Ynys Gau, another part of Merthyr, further down the river, there are some miserable habitations—rents high, as is not unusual in such places. For a room 10 feet by 5 feet, and 6 feet high, 6*s.* per month were found to be paid by a man who inhabited it with his two children. There are many wretched tenements also at Dowlais; and the filth amid which the inhabitants of these and similar places at Merthyr live calls for public attention and remedy, though, no doubt, much depends upon the habits of the people themselves. At present, however, be their disposition to cleanliness what it may, from the absence of drainage, and proper places whereon to throw their house-refuse, whatever neatness may exist inside, the outsides of their dwellings are beset with stinking pools and gutters. The tenants of the iron-companies, though their rents can readily be stopped from their wages, seem better contented than those of the small proprietors, many of whom seem to expect and take their rents every week. At the Plymouth works a ton of coals per month is allowed with their cottages, at a rate of about 4*s.* per ton, an arrangement which appears to give much satisfaction.

Respecting the habitations of the poorer classes, it is observed—

50. (General structure and condition of dwellings). “Generally speaking, comfortable cottages.” *J. ch.*

50. “Cottages built of quarystone, and stone-tiled, containing from three to five rooms each.” *R.*

50. (Stone cottages, tiled or slated). “Generally the poorer classes are cleanly in their houses.” *J. s.*

50. “The general structure is stone; the condition of some is wretched.” *M.*

51. (Families in a house. Number of persons in a room). “Most families occupy separate houses, and take in single men and women as lodgers.” *J. ch.*

51. “One family, and lodgers; single men chiefly. At the census time I think not above six in a house on the average.” *J. s.*

52. (State of air in houses, and ventilation). “The air is confined.” *J. ch.*

52. “Pretty good; large fires are generally kept burning in the cottages.” *R.*

52. “The quantity of fire causing a change of air is, in my opinion, the chief source of ventilation.” *J. s.*

52. “In some parts of the town, the houses are badly ventilated; there are no arrangements for ventilation.” *M.*

52. “Very unhealthy, through want of cleanliness, drainage, water, and ventilation.” *D.*

53. (Houses comfortably warmed). “Yes, decidedly; coal is burnt in a common grate almost night and day in winter.” *J. ch.*

53. “The supply of coal is abundant, and the price reasonable, being about 6*s.* for 18 cwt.” *R.*

53. “Most of the workmen have enough of fire.” *J. s.*

53. “Comfortably warm in winter.” *M.*

53. “The labouring classes generally burn coal night and day.” *D.*

21. “Very few cellar-dwellings, and, for such, tolerably well lighted and provided with fire-places.” *J. ch.*

21. “There are some cellar-dwellings, but they are fitted-up with fire-places and windows.” *R.*

21. “There are some, but the proportion is not large; lighted in front, as the ground is carried away. All with fire-places.” *J. s.*

21. "The cellar-dwellings are situated in the back streets, having no drainage or ventilation." *D.*

The cottages belonging to the Plymouth iron-works are widely scattered, some in rows, usually having gardens attached to them. These habitations, therefore, are of a rural character, and, as it were, constitute straggling buildings down the valley of the Taffe, below Merthyr, or on the side of the eastern hill. Coals, as above mentioned, are included in their rents, at the rate of 4s. the ton per month. Including the coals, the rents seem to vary from 10s. to 12s. per month. Public-houses or beer-shops are not allowed among them.

According to the statement of Mr. Roger Williams, relieving officer of No. 1 District, Merthyr Tydfil Union, which includes eight parishes, (No. 1 District, comprising Merthyr Tydfil, Dowlais, and Vaynor), in the houses with two rooms, the family always sleep upstairs in one room, without regard to sex or age; in some cases lodgers being added to the number. He has seen four beds in one small room, containing eight or ten persons. He was the enumerator in the census of 1841, and found the average to be about five persons per house. There is no Union workhouse, and all persons are relieved at their own houses. The number usually relieved is between 6000 and 7000 different persons per annum.

*Lodging-houses.*—The following is a return of the state of these houses by the superintendent of the Merthyr police, from which it would appear that, allowing, on the average, that each vagrant lodges two nights in a house, 10,950 pass through this town per annum; a number that would be reduced, supposing them to visit it more than once in the year. It is, however, estimated that at least this number annually come to Merthyr.

*Lodging-houses at Merthyr.*

Number of lodging-houses . . . . .	About 15.
Number of beds on the average in each house . . . . .	7.
Number of persons that can be lodged	15.
Average number of vagrants or lodgers per night in each house . . . . .	About 4.
Characters of the lodging-house keepers	Generally good; chiefly kept by workmen.
How ventilated . . . . .	Very bad.
Supply of water . . . . .	Very bad.
Necessaries . . . . .	None.
Number of persons in a bed . . . . .	Generally 2.
Number of beds in a room . . . . .	2, and 4 beds in a room.
General size of rooms . . . . .	8 ft. by 10 ft., and 8 ft. by 12 ft.

*Public Walks or Places of Exercise.*—There is nothing of the kind.

*Bathing-places.*—There are no public baths. The canal and river are used for bathing.

*Drainage, Ventilation, &c., of School-rooms for the Labouring Classes.*

23. The few school-rooms are tolerably well constructed, and some have play-grounds attached to them." *J. ch.*

23. "The national schools are well supplied with all these." *R.*

23. "The private schools for the workmen are merely rooms in their houses. No play-grounds but the streets." *J. s.*



23. "The school-rooms of the labouring classes are convenient. They have necessaries and small play-grounds." *M.*

*Health and average Age of Inhabitants.*—Merthyr Tydfil being a town which has rapidly increased by immigration within the last 40 years, and about half the population being considered not to be born in the place, it becomes exceedingly difficult to form a correct estimate of the health and average age of its inhabitants, so large a number of persons having become resident after those ages of childhood at which so many are swept off by different diseases. The following will show its rate of increase for the last 40 years:—

Year.	Population.	Increase.
1801	7,705	
1811	11,104	5,399
1821	17,404	6,300
1831	22,083	4,679
1841	37,264*	15,181

Of these 37,264, there were 18,290 (9,696 males and 8,594 females) in Lower Merthyr; and 18,974, (10,527 males and 8,447 females) in Higher Merthyr, including Dowlais and Vaynor, giving a total of 20,223 males and 17,041 females, or 54·3 per cent. males, and 45·7 per cent. females.

The following tables, furnished by the Superintendent-registrar, Mr. Edwards, will show the total births and deaths for five years in his district, one including Aberdare and Gelligaer, in both of which there are iron-works.

A STATEMENT showing the Total Number of Births and Deaths in the several Registrars' Districts of the Merthyr Tydfil District in Five Years, ending December 31, 1843.

District.	Births.	Deaths.
Upper Merthyr Tydfil District	3,697	2,591
Lower Merthyr Tydfil District	3,735	2,231
Gelligaer District . . . .	1,177	720
Aberdare District . . . .	1,740	1,012
Total . . . .	10,349	6,554

From these tables it appears that, in Upper and Lower Merthyr, the births exceeded the deaths in the five years by 2·610, or at the rate of 522 per annum. Taking the census of 1831 and of 1841 as guides, the rate of increase of the population would be 1518 per annum; so that the excess of births over deaths would account for little more than one-third of this increase, leaving two-thirds for immigration.

An immigration of this amount could scarcely fail to give a fallacious character to the average age at death, and to the health of the locality,

\* This number was furnished by Mr. Edwards, Superintendent-registrar, who was charged with taking the census in 1841, and corresponds with the registration district of Upper and Lower Merthyr. The area given in the population return, as published, only contained 34,977 persons; 19,068 males, 15,909 females. The parliamentary borough, including a portion of the adjacent county, contained 42,917 persons in 1841; 23,296 males, and 19,621 females.

yet, with these advantages, and taking the census of 1841, the per centage of deaths is 2·6 for the five years. In the adjoining district of Aberdare, one of a rural character, though containing immigrants to its iron-works, the per centage of deaths is 2·17, the deaths being at the rate of 202 per annum, and the population being 9322 in 1841. In the Gelligaer district the per centage of deaths is 2·3.\*

The following table, prepared from documents in the office of the Registrar-General, for 1840 and 1843, taken as illustrative years, shows (neglecting the class of gentry, of whom there were too few to afford any useful information) that while the average age of the tradespeople at death was for the males 32, that of the artisans (including puddlers, colliers, &c.) was only 17, and for the females 29 and 18. Abstracting the deaths under five years, the respective ages would be, for the males 48 and 35, and for the females 46 and 38, showing the great number of children of artisans or workpeople who die before five years of age. Of the 1882 of this class who died in the two years, 1011, or nearly 5 in 9 were under five years of age. Of the 150 deaths of tradespeople, 60, or 1 in 2·5 were under five years, which is still a considerable loss, though far less than among the class of artisans.

TABLE of the DEATHS, by CONSUMPTION and EPIDEMICS, distinguishing TYPHUS, in the Districts of Upper and Lower Merthyr, in the Two Years 1840 and 1843; showing their Rank and Average Age at Death: also the Total Deaths in the same period, and Average Age.

		Consumption.		Epidemics.		Typhus.		Average Age of.		Total Deaths.		Average Age at.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Gentry	Under 5 years . . .	..	..	..	1	..	..	25	1	..	1	..	1
	5 years and upwards	1	2	..	..	..	..	25	40	8	3	41	40
		1	2	..	1	..	..	25	27	8	4	41	30
Trades- people	Under 5 years . . .	1	2	2	4	1	2	1	1	31	29	10	1
	5 years and upwards	14	11	2	1	9	5	35	37	43	47	48	46
		15	13	4	5	10	7	32	25	74	76	32	29
Artisans, &c. .	Under 5 years . . .	29	27	129	108	46	25	14	14	528	483	1	1
	5 years and upwards	141	113	33	28	77	61	27	29	478	393	35	33
		170	140	162	136	123	87	16	17	1,006	876	17	18

From this table it appears that 1 in 6 of the total deaths was from consumption; less than for Brecon, Swansea, Carmarthen, and Haverfordwest, but greater than for the Cardiff district. Of the deaths among the tradespeople, 1 in 5·3 was from consumption, and 1 in 6·07 among the artisans. Of the total deaths, 1 in 9 was from typhus; a greater number than for Swansea, Cardiff, Carmarthen, Brecon, and Haverfordwest, and forming a marked cause of death. There is scarcely any difference of loss from this disease between the tradespeople and artisans.

\* Calculating from the information contained in the Quarterly Table, No. 2, 1844, published by authority of the Registrar-General, the per centage of deaths to the population for the six years, 1838-43 (taking the census of 1841), would be for the Abergavenny district 2·4, for Pontypool 2·3, and for the whole Merthyr Tydfil district (population 52,864) 2·57.



In order still further to ascertain any difference that might exist between the different classes of workmen employed at the iron-works, the following table has also been constructed from documents in the Registrar-General's office for the same years; firemen, those engaged in the rolling-mills, &c., being included under the general head of "Puddlers, &c." The females of the families are included under the heads of the classes of workmen to which they belong.

TABLE of the DEATHS by CONSUMPTION, &c., of Colliers, Iron-Miners, and Puddlers, &c., in the same Districts and Periods, with their Average Age; and the Total Number of Deaths of the same Average Age.

		Consumption.		Epidemics.		Typhus.		Average Age of.		Total Deaths.		Average Age at	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Colliers .	Under 5 years . . .	5	5	24	19	5	5	1	2	89	86	1	1
	5 years and upwards	19	26	4	3	12	6	25	32	82	56	33	36
		24	31	23	22	17	11	14	18	171	142	16	15
Iron Miners .	Under 5 years . . .	9	5	26	22	12	4	2	1½	125	90	1	1
	5 years and upwards	36	28	7	3	14	15	25	28	103	83	33	35
		45	33	33	25	26	19	15	17	228	173	15	17
Puddlers, &c. .	Under 5 years . . .	5	3	21	13	9	6	1½	1½	77	50	1½	1
	5 years and upwards	10	14	2	4	3	7	27	18	26	23	34	27
		15	17	23	17	12	13	9	10	103	73	9	9

According to this document, the average age of the colliers, iron-miners, puddlers, &c. is about the same, and that of the females of the two former somewhat higher, while those of the females of the puddlers, &c., is much lower; appearing as if deaths among the young female children and young girls of this class much reduced the average age at death. The great mortality among the children of this class under five years lowers its average age at death, for all ages, to only nine years, while that of the others is much higher, and nearly equal for the two, 15½ and 16 years. It appears that, while the average ages at death of the females belonging to the families of the colliers and iron-miners, who perished from consumption, epidemics, and typhus, at five years and upwards, were respectively 32 and 28 years, that for the females of the puddlers, &c., was only 18 years. Of the 176 deaths of the latter class, 127, or above 7 out of 10, were under five years. Of the total deaths among the colliers (313), 5½ out of 10, were under five years. Of those among the iron-miners (401), about 5⅓ were under five years. With respect to consumption, this table gives 1 in 4·3 of the total deaths for the males of the collier class, and 1 in 2 for the females; 1 in 2·8 for the males of the iron-miner class, and 1 in 3 for the females; 1 in 2·6 for the males classed under puddlers, &c., and 1 in 1·6 for females, the ages of all being five years and upwards. Of those who died of typhus of the collier class, 1 in 17·5 under five years, and 1 in 7·7 above that age, are represented to have so perished; of the miner class, 1 in 13·4 under five years, and 1 in 6·4 among those above it; and of the puddlers, &c., 1 in 5·8 under five years, and 1 in 4·9 above that age.

With regard to medical attendance for the poor, the plan adopted by the four iron-companies, of each providing medical attendance for the workmen employed by the respective companies and their families, in

some measure removes the want of hospitals and infirmaries, of which there are none, since so large a proportion of the population is employed directly by these companies. The poor, not belonging to the works, are attended by the medical officer of the Union. Each person employed in the works pays a certain sum, apparently 2*d.* in the pound, to a sick-fund, receiving medical attendance when required.

The tables given above being only for two years, they can be regarded as little else than approximations; but still, allowing for this, and also for the imperfect registration of the classes, more especially in the three divisions of that of artisans, &c. into colliers, miners, and puddlers, &c., there remains evidence of considerable mortality among the poorer orders, much of which may be referred to the state of the air they breathe, from causes, some of which, no doubt, may be modified by themselves, but leaving others that can only be removed by public aid and regulations. Merthyr Tydfil, with Pen y Daran and Dowlais, may be regarded as chiefly a large cottage town, without any public care for supply of water, drainage, or cleansing; the open character and small height of its straggling buildings, and consequent exposure to sun and air, saving its population from still greater evils than those to which they are now exposed from the filth so abundant in it.\*

## REPORT on the SANATORY CONDITION of BRECON.

BY SIR HENRY T. DE LA BECHE.

*Situation.*—This town, which has been selected for comparison with Merthyr Tydfil, and as an example of a county town in South Wales, surrounded by a rural population, and itself containing no manufactories, is agreeably situated at the confluence of the Honddu (a minor stream, taking its rise at the distance of about 14 miles among the high ground on the north) with the Usk; another small stream, the Tarrel, rising in the range of the Vans of Brecon (the highest land in South Wales, 2862 feet above the sea), about seven or eight miles distant, also joining the Usk close to the town.

The greater part of Brecon stands well on ground rising northerly from the Usk; but the portion which is on the south of that river, named Llanfaes, is flat, and not much raised above the usual bed of the river. Much of the Wotton is also flat.

*Climate.*—Though Brecon can scarcely but feel the influence of the mountainous country in which it is placed, yet, as the valley of the Usk becomes considerably extended in the neighbourhood of the town, it

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\* At the conclusion of his answers to the questions of the Commissioners, Mr. James, Chairman of the Board of Guardians, says:—

“I have given brief answers, to the best of my ability, to most of the questions annexed. Upon the whole, I beg to state my decided opinion that no town in England or Wales of the extent and wealth of Merthyr Tydfil is so much in want of proper regulations as to cleansing, lighting, paving, and watering, and there is no chance of such being ever accomplished except by some compulsory means enacted by the Legislature; and as an individual deeply interested in house property of every description, I beg to recommend that all rates for effecting the desired object should be levied upon the owners, and not upon the occupiers of houses.”—*Merthyr*, 23rd July, 1844.



cannot be considered as very much embedded among hills and mountains, but as having a somewhat open and airy character; the winds, though broken in their force by the surrounding high lands, still sweep over the surface beneficially. No record appears to have been taken of the temperature or fall of rain; but being elevated between 500 and 550 above the level of the sea at Newport, as ascertained by the canal extending from Brecon to that port, it is cooler than on the coast, at the same time that there is much rain, as might be expected from its position.

*Geological Character of the Ground.*—The northern part of the town stands on beds of the sandstones and marls, usually termed the Old Red Sandstone, which are covered considerably by gravel-drift in places, especially on the lower ground. Llanfaes, on the south of the Usk, is on alluvial ground, in which there would appear much gravel. The northern part of the town may be considered as naturally dry, and even the southern portion is not far otherwise, under ordinary conditions. With the exception of the flat ground of Llanfaes, and of the Wotton, some of which would require care, the rest of the town possesses great natural facilities for drainage.

*Floods.*—From the bridge, and the arrangement of the buildings on each side of the Usk near it, impediments to a free discharge of freshets might be expected; and accordingly the district of Llanfaes is sometimes flooded. Mr. Bevan, Mayor of Brecon, in his replies to the questions of the Commissioners, observes—

3. "One street, called Llanfaes, in the parish of St. David's, is liable to be flooded by the river Usk, upon very high floods, once perhaps in every five or six years."

Mr. Baylis, county surveyor of Brecknockshire, in his replies to the same questions, says—

3. "The beds of the Usk and its tributary streams rising very rapidly, these rivers are subject to be swollen after heavy rain; and some of the houses near the banks of the Usk are inundated almost every winter. The water has been known to rise three feet in one of the principal entrances to the town" (Bridge-street, Llanfaes).

4. "The piers of the Usk bridge are much larger than necessary, and obstruct the free passage of the flood-water. Piers at least one-half their present dimensions would be of sufficient strength to support that structure; or every other pier might be taken away, and the upper part of the bridge reconstructed with arches of larger span, so as to afford additional space for the passage of the flood-water."

*Drainage and Supply of Water.*—The town is partly under the control of Commissioners of Paving, Sewers, &c., and in part only under the Highway Act, the jurisdiction of the Commissioners not extending over the whole area comprised within the town. Those parts coming within the power of the Commissioners are, from the information of the mayor, such as are situated in the parish of St. John the Evangelist, and in the chapelry of St. Mary.

There is no survey of the town having reference to a system of levels from a common datum. "This," observes Mr. Baylis, "is very much to be regretted, as no efficient system of drainage can be established without such preliminary information."

The Act under which the Commissioners exercise their powers is an

old one of 1775 (16 Geo. III. cap. 56), and is remarkable as including clauses for a supply of water for the inhabitants. It is for "Supplying the Borough and Town of Brecknock and Liberties thereof with Water; and for Paving, Cleansing, Regulating, and Lighting the Streets, Lanes, and Public Passages there; and for widening and making commodious some of the said Streets, Lanes, and Passages."

This Act appointed many Commissioners, among whom were the Bailiff, Recorder, Aldermen, Common Council, and Town Clerk, the Burgess of the Borough, the Vicar of Brecknock, the Archdeacon of Brecknock, and the Vicar of St. David's for the time being, with 117 other persons who were especially named.

In case of death, removal of residence from the borough, or neglect to act for the space of one year, except in the case of Commissioners by virtue of their offices, the remaining Commissioners elect others into their places, ten days' notice being given.

The qualifications of the Commissioners are, either possessing in their own right, or that of their wives, 10*l.* per annum in lands, houses, &c., or being a tenant of 15*l.* per annum, residing in the town or liberties, the penalty for acting without proper qualification being 50*l.*

The Commissioners at all meetings defray their own expenses, and are not capable of acting while they hold any place of profit under the Commission, or have any share or interest in any beneficial contract in the execution of the powers of the Act, under a penalty of 10*l.* for each time of acting.

Commissioners who are justices of the peace may act as such in the execution of the Act, except when personally interested.

Five Commissioners constitute a quorum, and no acts are valid unless done at a public meeting. The books kept are open to the inspection of the rate-payers under the Act at all reasonable times. The Commissioners appoint and remove the treasurer and other officers, who give security, and account to the Commissioners.

The Commissioners have extensive powers for supplying water to the town. Any nine or more of them are empowered to treat with the owners of lands and tenements considered necessary to be used for the supply of water; but it does not appear in what manner they could compel a passage through such lands and tenements. It was provided that the bore of the pipe taking water from the river Honddu should not exceed four inches; and no other supply being taken but from this river, all the water received in the reservoir, whence the town is supplied, comes through a pipe with this diameter.

The Commissioners are enabled to contract for the supply of water into the borough, and with private persons for supplying their houses; the money received to be in the first place applied to the supply of water, and if there is any overplus, such overplus is to be applied to the other purposes of the same Act, and "to no other use or purpose whatsoever."

The owners or occupiers of houses agreeing with the Commissioners for a supply of water pay for their private pipes, make good the pavement disturbed for laying them down, and keep such pipes in repair.

In case the terms agreed upon (termed rates in the Act) are not paid half-yearly, the Commissioners are empowered to enter the premises and distrain in the same manner as landlords for the arrears of rent.



The Commissioners are not empowered or obliged to repair or cleanse any places included in the Turnpike Acts. They may cause the streets, &c., under their jurisdiction to be cleansed in any manner they may think proper, sell the refuse, cinders, &c., and contract with any parties for their removal, the money arising from the sale to be applied to the general purposes of the Commission, the inhabitants being enabled to dispose of any refuse, cinders, &c., within their premises, as they may think proper.

The inhabitants are compelled to sweep the footpaths before their houses, extending to the next kennels, between 2 and 6 P.M., under the penalty of 2*s.* 6*d.* for every neglect, and may have the sweepings as their property. The scavenger or contractor removes the refuse in and between the kennels at times appointed by the Commissioners, under penalty of 20*s.* for each neglect.

The Commissioners are empowered to remove any sheds, pent-houses, walls, spouts, &c., considered as obstructions or nuisances; and in case the occupiers neglect or refuse to remove such obstructions or nuisances, after 20 days' notice given, the Commissioners may cause this to be done at the expense of the occupiers.

In case any nuisance is made or erected contrary to the regulations of the Commissioners, the offending parties forfeit 40*s.* and 2*s.* per day until the nuisance is removed; and any master or workman employed to erect any building, or do that which is a nuisance, is liable to a penalty of 20*s.*

A penalty of 2*s.* is incurred for each pig by parties permitting swine to wander about in the streets, and they are to be impounded; and in case the penalty and expense of pounding are not paid within six days, the swine are sold, the overplus being paid to the owners.

A penalty of 20*s.* may be levied for throwing ashes and filth upon the footways, or for riding on the footways.

The occupiers may be rated, for the purposes of the Act, at a sum not exceeding 1*s.* in the pound of the yearly rent or yearly value of the "houses, shops, warehouses, yards, gardens, lands, tithes, and premises," as have been usually rated for paving, &c., the rate to be signed or allowed by two justices of the borough. The rates to be levied in case of refusal, after 10 days' demand, by distress under the warrant of two justices of the borough. Incoming and outgoing occupiers to pay proportionable shares of the rates which may be due.

The Commissioners have power to exempt, at their discretion, poor persons from the payment of rates.

Persons considering themselves aggrieved have a power of appeal, within three months, to the quarter sessions of the county, the determination of which is final, the justices having the power to amend the rates complained of, should they consider it right.

Actions to be brought against persons on account of this Act must be so before the expiration of six months after the offence has been committed, and 21 days' notice given; and if it should appear that this was not done, and that reasonable amends were tendered before the action was commenced, then the jury are to find for the defendants, and the latter are entitled to recover treble costs. Persons who bring actions by order of the Commissioners recover, upon conviction, double costs.

An instance of apparently neutralizing opposition to this Act, on the part of an influential person, is shown in a clause which provides, "That nothing herein contained should extend, or be construed to extend, to empower the Commissioners for the time being to assess any of the freehold lands whereof *Penoyre Watkins*, Esquire, is now seized, lying within the said borough or the liberties thereof." The lands then exempted continue so to the present time.

The sewerage of the town is of an insufficient kind, and is little more than surface-drainage in the chief streets, into which it is stated that the refuse from some houses, including matters discharged from privies or water-closets, is delivered. Mr. Bevan says,—

7. "There are drains in all the principal streets, some of which act as sewers."

Mr. Baylis, who has been at much trouble to collect information on this head, observes,—

6. "The regulations for the drainage of the town are very defective, as will appear from the survey I have prepared of the town and drainage (alluding to a plan sent in, with the drainage marked upon it), and the annexed table, showing the size of the various drains.

"Silver-street, Heol Hwnt, Mill-street, &c., are generally in a very disgraceful state, and full of holes, where water stagnates: this state of things must be very detrimental to the health of the inhabitants. In the streets above mentioned, and others in the town, ashes and other filth are commonly thrown from the houses, where it is suffered to accumulate until the streets are rendered almost impassable; but as they are not principal thoroughfares, they escape the notice of the authorities. It has occurred to me that if an officer were appointed as an inspector of nuisances, &c., for the town, so as to suppress these abominable practices, the comfort of the inhabitants would be promoted, and the general health of the town improved."

7. "There are no sewers in the town, with the exception of a small one, 2 feet in diameter, in Castle-street. The drainage of the town is effected very inefficiently by means of small surface-drains, and many of them are much too small to take the surface-water away during heavy rains."

8. "The houses of the middle and upper classes are provided with proper water-closets or necessities; but for the poorer orders one is made to serve for several houses, and these are in many instances placed in exposed situations, in others, close to dwelling-houses in confined courts. There are many cottages entirely without such conveniences. The necessities empty generally into open cesspools, which are cleansed by manual labour, and the contents carted away for manure.

"The only houses in the town where the necessities empty into the sewer are situated at the northern end of the Struet and in Berkeley-place and Castle-street, and these sometimes emit offensive smells from the want of being trapped: those in Castle-street are situated in a small area under the flagging in the street, and opening out of the kitchens.

"As the taps are situated close to them, water can be turned on at any time to cleanse them.

"Some of the houses in the town have deep cesspools or wells, into which the necessities discharge themselves; the liquid refuse and drainage from the houses also run into them, which converts the whole into a fluid, and this is supposed to pass off through the gravelly strata. They have not been opened or examined for several years, but an offensive effluvium arises from them in rainy weather."

9. "A few of the respectable houses have drains communicating with the drains in the streets, but the inhabitants of the cottages almost invaria-



bly throw their refuse waters, &c., into the streets, more especially those at the lower end of the Struet, Llanfaes, the Wotton, and the smaller streets."

10. "The drains are not constructed on a plan to cleanse themselves efficiently. Upon a recent examination of them, I found considerable accumulation had taken place in them; in fact they were perfectly useless for the purpose intended. I have been informed that they had not been cleansed before for several years. The drain in the Wotton has not sufficient fall to cleanse itself; and this is the only part of the town where there are cesspools (catch-pits) to receive the filth and sediment.

"The drains are not trapped to prevent the escape of noxious and offensive gases, nor are there any means adopted to prevent accumulations from taking place in them.

"If a sufficient system of sewerage were established in this town, water could be readily obtained from a higher level, so as to wash the sewers, and prevent any deposit from taking place in them.

11. "Local regulations for the efficient sewerage of this town, and the cleansing and repairs of drains on some scientific and systematic plan, are very much required; at present there are not any."

12. "A large proportion of the liquid refuse of the town is thrown into the street, and, where there are no drains, either soaks into the subsoil, or remains stagnant on the surface."

13. "The form of the sewer in Castle-street is cylindrical, and of 2 feet diameter. The cost per running foot is 2*s.* 8*d.* The other drains in the town are square, with side walls of dry masonry, with a flat covering-stone from 3 to 4 inches thick upon them. They vary in size from 12 to 18 inches, and the cost per running foot varies according to the size.

A 12-inch culvert costs 2*s.* 6*d.* per running yard.

A 15-inch           ,,           3*s.* 3*d.*           ,,

An 18-inch       ,,           4*s.* 0*d.*           ,,

"There are but few of the houses with drains communicating with the drains in the streets. When they exist, they are about 1 foot square."

14. "The drains in this town are cleansed by manual labour, but at no stated periods. As they have not been emptied for some time past until recently, the annual expense must be very trifling."

Mr. Bevan, the mayor, in answer to similar questions, from 8 to 14 inclusive, observes:—

8. "Most of the houses have necessaries."

9. "Under the Local Act, the occupier of every house is compelled to keep a trough under the eaves of his house, the whole of the water from which is carried into the sewers (drains) by pipes."

10. "Yes; the sewers (drains) empty themselves into the rivers Usk and Honddu."

11. "The Commissioners have full powers under the Local Act."

12. "All the liquid refuse is carried into the sewers (drains), and by them into the rivers Usk and Honddu."

13. "A large square gutter covered with flat stone slabs."

14. "They (the drains) are cleansed by the order of the Commissioners, at the average annual expense of about 10*l.*"

From the absence or scarcity of drainage in the poorer parts of the town, which seem to be chiefly under the Highway Act, and the scarcity of necessaries among the smaller cottages, the inhabitants usually throw their slops and refuse into the streets; a not uncommon practice even with those who keep the interior of their houses neat and

clean. This custom may be considered as usual and common among the poorer classes of this part of the country.

With respect to the duties of the scavenger, the mayor observes :—

15. "A scavenger contracts for cleansing the streets, at a salary of 20*l.* per annum, besides the manure which he collects, which he also takes for his own benefit. The streets are cleansed twice every week."

18. "The scavenger has a place in a back street for the deposit of the manure."

19. (Enforcement of cleansing and prevention of nuisances.) "The Commissioners under the Local Acts are vested with full powers."

In this answer, Mr. Bevan alludes to a recent Market Act for Brecon, which also provides against nuisances, such as the accumulation of ashes, &c., for which penalties, not exceeding 60*s.* can be levied. By the same Act, the corporation may erect slaughter-houses, and when such slaughter-houses are erected, no cattle, &c., are to be slaughtered elsewhere in the town.

With regard to cleansing, Mr. Baylis states that—

15. "The principal streets are swept every week; but this, at some seasons, is not so often as is required. The expense incurred by the borough is 20*l.* per annum, the scavenger taking the manure also. The sweepings are frequently allowed to remain in the streets many hours. The footpaths are swept by the inhabitants at their discretion."

16. "Many of the small streets, courts, and alleys, which are inhabited by the poorer classes, are not swept at all, and the refuse, ashes, &c., are allowed to accumulate until the smell becomes intolerable, when it is disposed of to the farmers in the neighbourhood."

17. "The houses of the respectable inhabitants are provided with dust-bins, which are emptied as often as they require; but the majority of the poorer classes throw their refuse into the streets."

18. The contractor for the scavenger's work is a gentleman who occupies a large farm in the neighbourhood, where the manure is taken."

19. "There are Local Acts for cleansing the town (the Market and the Borough Acts), but the responsible authorities do not generally enforce the same, nor is the commission of nuisances prevented except in the principal streets."

*Supply of Water.*—It has been seen, that by the Local Act the Commissioners have the power to supply the town with water, transferring any profits that may arise from such supply, either to improvements in the supply, if required, or to the general purposes of the Act. The only works constructed by the Commissioners are those at the town end of the Priory walks or groves, to which water is led from the river Honddu, taken up in a leet, a short distance further up the stream. The water is there raised by a water-engine a few feet to a small reservoir, through a 4-inch pipe, as limited by the Act, whence it falls by its own gravity through the mains and pipes to the houses supplied. No pains are taken to filter this water: so that when the river is coloured by matter mechanically suspended during floods, the leet waters are coloured also, and pumped up into the reservoir. This discoloration continues a long time in the leet, and the bottom necessarily becomes muddy. Very simple contrivances would remedy this evil, and the water be rendered, to the inhabitants supplied, in good condition, and applicable to other than the common household purposes for which it is now used.



Respecting the supply of water, the mayor observes :—

28. "The water is brought from the river Honddu in a water-course; it is then pumped up into a reservoir by an engine, from whence the town is supplied by pipes laid down the principal streets."

29. (The distribution.) "By the Commissioners, under the Local Act."

30. (Number of houses supplied.) "About 170; no tanks; several houses keep large tubs."

32. "The poorer classes are supplied with water from wells. Some are supplied by tradespeople; but that is contrary to the contract under which the water is supplied."

33. (Complaints made of water.) "None."

34. "The whole rental payable to the Commissioners for water is about 100*l.* per annum; the price per annum for every house where there are only two in family, is 10*s.* 6*d.*; if more than two, 4*s.* per head; 1*l.* 11*s.* 6*d.* is the highest charge for one house, which cannot be increased. All inns, two guineas per annum."

35. (Quantity supplied.) "No particular quantity. As much as they require."

36. "The price of water cannot be enhanced except by an order at a meeting of the Commissioners. For a deficiency in quantity there is redress by applying to the Commissioners."

37. "Deficiency in supply can be remedied by taking water from the river Usk, but it would require the erection of a new water-engine."

38. (Use of filters.) "In some private houses."

39. (Water kept on.) "In the winter, all night. In the summer, 12 hours every day."

40. (System of stand-pipes.) "None."

41. (Water constantly kept on in the mains.) "Yes,"

43. "Fire-plugs have only recently been laid down. They are on the main-pipes in the principal streets."

44. (Average number of fires.) "Two fires during the last 10 years."

46. "Yes; in consequence of the bad state of the engine, a new one has recently been purchased by the corporation for the use of the town."

Under the head of "Supply of Water," Mr. Baylis gives the following answers :—

26 and 27. (After noticing the mode of supply, he adds):—"The site of the reservoir is very injudiciously chosen, being situated below the Priory churchyard, and within 160 feet of it. There are several excellent springs in the neighbourhood. Many persons who can, obtain their water from them, and use it in preference to the water from the water-works. The streets of the town are not watered. The authorities are now engaged in putting fire-plugs, for the supply of the fire-engine. The fire-plugs are awkwardly constructed, and are covered with large flag-stones, instead of a proper cast-iron socket, &c."

28. "The water is distributed by means of cast-iron pipes, four inches diameter, as mains, from whence branch-pipes convey it into the houses. The only parts of the town that are supplied with water from the water-works are the Struet, High-street, Bulwark, Lion-street, Glamorgan-street, Ship-street, and Castle-street; but as this is only a small portion of the town, it would be a great public benefit to extend it throughout. The main-pipe is too small for the proper supply of even the present consumers, and allows no scope for an increased consumption."

30. "There are about 1500 houses in the town and suburbs, some of which are unoccupied."

31. "The water is laid on to 170 houses. Some of them have tanks, but the great majority have only taps."

32. "The poorer classes obtain their supply of water either from the

river, pumps, or draw-wells, and some are in the habit of begging it from those supplied by the water-works."

33. "The water obtained from the water-works, in consequence of not being filtered, is not in a pure state at all seasons."

36. "In the event of the quality or quantity being deficient, the consumer has no means of redress that I am aware of."

37. "If the supply of water is deficient in quality, the law should compel the responsible parties to filter it, and also to afford a supply adequate to the wants of the inhabitants."

38. "There are very few filters in use in this town."

39. "The water is kept on constantly day and night in the winter, and 12 hours a-day in the summer months, except in dry seasons, when the supply is inadequate. At this season (July 1844) the water is turned on about three hours a-day."

40. "There is no system of stand-pipes adopted for cleansing the fronts of the houses."

41. "When the supply of water is adequate, the pipes, I believe, are kept constantly charged, but until lately the inhabitants had no efficient fire-engine. I have recommended the authorities to have a larger reservoir for the supply of the town, and to adopt the high-pressure system, so that a supply of water may be ready at any moment to throw over the buildings in case of fire; as I have observed frequently in other towns, that so much time has been lost in procuring the fire-engines, and getting them properly to work, that the buildings have been complete ruins before they have arrived, and have been brought to bear upon them."

42. "In the event of a fire it would be about half an hour before a supply of water could be obtained at the extreme point from the water-works, and the fire-engine to be brought to bear on the premises."

43. "A supply of water can be obtained from the water-works for the protection of the churches and the public buildings in case of fire, as far as the mains extend, except in dry seasons. In other situations, the supply must be obtained from the rivers, wells, &c."

44. "Two fires have occurred within the last two years. I am informed that no fire had taken place at Brecon for 10 years before."

45. "There are no fire-proof buildings or party-walls to prevent the extension of fire in Brecon. Many of the buildings in this town are very old, and contain a great proportion of timber, which is partially decayed or affected with the dry rot. Lath and plaster walls also predominate. If a fire were to take place in many parts of the town, the conflagration would be awful, and no human aid or skill could prevent their total destruction."

46. "A good fire-engine has lately been purchased by subscription and presented to the town; the police have the care of it, and would officiate as firemen in case of need."

*Habitations of the Poor.*—Though the chief streets of the town have a fair appearance, and many houses of the more wealthy inhabitants are large and good, Brecon generally, in its principal thoroughfares, having a good appearance for a country town, there are many poor cottages in it, chiefly in the back street of Llanfaes, Hoel-Hwnt, Kensington, Mill-street, and other places. These cottages most frequently consist of two rooms, the upper being the sleeping-place for the whole family, and for the most part very ill-ventilated. Indeed, in many of these cottages, the upper-room windows seem never to be opened, and in some there are no means of doing so. The rent of these cottages appears to vary from 2*l.* to 5*l.* per annum. A general view of the proportion of the small tenements to the large has been obtained from a return of the rated inhabited houses, furnished by Mr. Davies, superintendent registrar.



From this it appears that out of 1322 houses enumerated, 849 were rated at 5*l.* and under, and 1024 at 10*l.* and under, or 64 per cent. at and under 5*l.* and 77 per cent. at and under 10*l.*

Respecting the cottages, Mr. Bevan remarks that—

50. "They are principally built with stone walls, and have tiled roofs; some of the old buildings have thatched roofs; and there is one family to each cottage."

On the same head Mr. Baylis observes that—

50. "The cottages of the poorer classes are generally small, inconvenient, and slightly constructed. They are built of bad materials, rough rubble-stone masonry, and very inferior mortar, so that in wet seasons the damp penetrates through the walls, and there is no arrangement made for drainage. The roofs of some of them are covered with thatch. Considering Brecon as a small town, the rents of these small cottages, containing from two to three rooms, appear extremely high. They exact from 3*l.* to 6*l.* per annum, when the first cost of the building and land could not exceed from 30*l.* to 50*l.*"

51. "Generally speaking, only one family resides in each house, and the average number is about five persons. The rooms in the cottages generally vary from 10 feet by 8 feet to 12 feet by 10 feet.

52. "The air of many of the cottages appears much vitiated; but this is not surprising, when we consider the many inconveniences to which the poor are subject, being confined in small rooms, having in some cases a bad supply of water, and no arrangements for ventilation. Some of the (bed) chambers in the cottages have only a small skylight in the roof, which admits the light imperfectly, and not being made to open, cannot be used for ventilation."

53. "Although Brecon is situated within 20 miles of the coal-mines, with a good water conveyance (canal), the price of coal delivered at the houses is 17*s.* 6*d.* per ton. This high price places it, in a great measure, out of the power of the labouring classes to obtain a sufficient supply. They have small grates in their houses. Proper kitchen-ranges, with ovens, have only been very recently introduced to the superior class of houses in Brecon. Most of the cottages have no grates in the (bed) chambers."

*Lodging-houses.*—From the returns of the police, it appears that there are eight lodging-houses in the town, averaging two bed-rooms for lodgers in each house, with two beds in each room. There are generally eight lodgers in each house, two in each bed, paying 3*d.* each. On the average, the vagrant lodgers stay two nights, which would give 11,680 per annum. It should be observed, that when closely questioned, the lodging-house keepers, whose character at Brecon is stated to be good by the police, were found to reckon, as is rather common with this class of persons, a man and his wife, with two or three children, and who sleep in the same bed, as only two, because it is customary only to charge 6*d.*, as for two, for the whole. After inspecting this class of houses in different towns, the lodging-houses in Brecon appeared fairly clean, especially as to the beds, but there was the usual absence of proper ventilation and drainage. The mayor states (55) that "the police officers have strict orders from the borough magistrates to visit the lodging-houses nightly."

*Public Walks.*—In this respect Brecon is well provided. The "Captains' Walk," so called from having been frequented by French officers on parole here during the late war, is an agreeable promenade on the side of the Usk, and the Priory walks extend for about a mile

along the steep, picturesque, and wooded right bank of the Honddu, from the priory to the northward.

*Health and Average Age at Death.*—The population of Brecon somewhat more than doubled itself during the 40 years ending 1841, as appears from the following table:—

POPULATION OF BRECON from 1801 to 1841 inclusive.

	Persons.	Increase in 10 Years.
By the Census for 1801	2,576	..
"      1811	3,177	601
"      1821	4,193	1,016
"      1831	5,026	833
"      1841	5,214	188

This would give the greatest increase between 1811 and 1821, and the least between 1831 and 1841. In the account of the census for 1841, as published, the number given as the population of the town, deducting 289 for part of Llywell parish (added to the former parliamentary borough), in order properly to compare with the district for which the census was taken in 1831, was 5412. The above number of 5214 was obtained from Mr. Davies, who took the census; and the difference of 202 is due to the numbers in the barracks, &c., purposely omitted in the latter amount of population. Even with the addition of these 202, the rate of increase between 1831 and 1841 was smaller than for any of the preceding 10 years.

The following is a general statement by Dr. Lucas, physician at Brecon, of the health of the town.

*Medical Report by Dr. Lucas.*

"The general condition of Brecon may, upon the whole, be pronounced healthy. It is rarely visited by epidemics; and when they have occurred, they have been much confined to those parts of the town in which cleanliness and efficient drainage have been least attended to."

"A striking instance of the effect of inattention to these particulars was afforded in 1839-40. The epidemic gastric fever, which in that year prevailed over a great part of the kingdom, extended also to Brecon. It was general over the whole town; but the ill-drained, ill-ventilated, and dirty districts at the head of the Struet, Bailey-Glâs, and Kensington were particularly infested by it. There is another district of the town equally, or even more favourable, to the propagation of fever than any of those named, viz., Llanfaes, and especially that part of it called Heol-hwnt, which lies low, near the level of the river, is flat, and entirely without drainage. In the two preceding years, Hoel-hwnt had been inundated by the rivers Usk and Tarrall, and by this means the accumulated filth of years had been effectually scoured away. It is a fact that this district, in which disease is usually so rife, was comparatively free from the epidemic of 1839-40.

"The worst parts of the town are the districts already mentioned. In these the houses are generally small, having on the ground-floor one or sometimes two rooms, and low, small, close bed-rooms under the roof above. They are generally in tolerably good repair; very few, indeed, are not weather-proof. They are almost universally unprovided with privies. The gutters run in front of the houses, and on the surface, not underground, and are, of course, often exceedingly offensive both to sight and smell. The windows are not always made to open; and when they are, this class of people have generally a great dislike to the admission of fresh air into their dwellings. But with all their imperfections, the dwellings and physical



circumstances of the poorer classes of Brecon are of a better order than I have observed in other towns with which I am acquainted.

"It would be very difficult, even with the most carefully kept registers, to form any calculation of the average duration of illness amongst the working classes, sufficiently correct to enable a true result to be deduced from it. The illness of a working man might be taken to commence at the time it compelled him to give up work, and to terminate as soon as he was able to resume his labour; but they rarely apply for medical advice until they have first tried the effect of rest and their own remedies upon their complaint. Often these are sufficient, and thus a not inconsiderable portion of sick workmen do not enter at all into the calculation. Of those who seek medical advice, as soon as their more urgent symptoms have subsided, many cease to come to their medical adviser, whether it be at his own house or at a public institution, and thus they are lost sight of. Consequently it is chiefly the more serious cases; those sick who, having laboured under severe inflammatory or other dangerous disease of important organs, have excited more interest and been more particularly attended to up to the close of their illness,—it is these cases mainly which would form the elements of such a calculation. But an average so deduced would obviously be deceptive.

"The parochial poor in their illness may be attended by the surgeon of the district, under the usual regulations of the New Poor Law. Those who do not receive parochial relief may receive medical aid, as in or out door patients, at the county and borough infirmary.

"This institution, established in 1835, is supported by voluntary contributions, and patients from any part of the kingdom are admitted into it on the recommendation of a subscriber. The average annual number of patients is rather above 500. Its income, arising out of annual subscriptions and a small permanent fund, amounts at present to about 300*l*. With this it is enabled to have eight patients continually in the house, and affords relief to as many applicants for out-door assistance as choose to apply to the subscribers for a recommendation.

"*Brecon, July 27th, 1844.*

"PRESTWOOD LUCAS."

Taking the deaths during the five years ending the 31st December, 1843, at 713, as given in the following table, and the population of 1841, at 5214, both furnished by Mr. Davies, superintendent registrar, the rate of mortality is 2·7 per cent., a very high rate considering the proportion of houses rated at 10*l*. and upwards, the absence of any manufactures apparently unhealthy, and the situation of the town. It is one equal to that of Newcastle, Leeds, Sheffield, Ashton, and Oldham, Bury, Wigan, Macclesfield, Birmingham, and Exeter.

TOTAL NUMBER of BIRTHS and DEATHS registered in the Borough of BRECON for Five Years, ending 31st December, 1843.

Births.			Deaths.		
Males.	Females.	Total.	Males.	Females.	Total.
384	377	761	353	360	713

From this table it appears that the increase by births during the five years has been only 48, or the rate of 9·6 per annum, and the superintendent registrar considers that the births are well registered. The increase in the population of Brecon between the years 1831 and

1841 was 188, or at the rate of 18·8 per annum, showing that the births amount to only one-half of this increase. The immigration is no doubt small; but as far as regards deaths, it rather tends to make the rate of mortality really higher, as these immigrants seem to have come into the town at ages above five years.

The following table, furnished by Mr. Davies, will afford a view of the mortality in different parts of the borough. It will be seen that in the parish of St. John and in the Castle district the rate of mortality is 2·86 per cent., in St. Mary's 2·32 per cent., and in St. David's 3·3 per cent. No very useful conclusions can be drawn from the College district, being so small. The rate of its mortality is only 0·96 per cent. As a whole, these different rates of mortality correspond with the areas imperfectly drained and cleansed, the habitations of the poorer classes, and with those inhabited by the more easy and affluent, where not only the houses are better, their inhabitants not subjected to the same chances of disease and death, but where also drainage and cleansing receive more attention.

NUMBER of DEATHS registered in the several Parishes under mentioned within the Borough of BRECON for Five Years, ended 31st December, 1843.

	Parish of St John the Evangelist and the Castle.	Parish of St. Mary.	Parish of St. David.	Extra Parochial Township of Christ's College.	Total.
Population . .	1865	1945	1300	104	5214
Deaths. . .	267	226	215	5	713

From the following table, constructed from the returns furnished by Mr. Davies, the superintendent registrar, it appears that the deaths under five years formed nearly one-third of the total deaths, being 1 in 3·1. Of these deaths under five years, 1 in 4 was among the gentry; nearly the same among the tradespeople (1 in 3·97); 1 in 2·9 among the artisans and labourers; 1 in 3·6 among the paupers; and 1 in 2·2 among the undescribed; the total number of deaths among the latter class, 124, somewhat embarrassing the results obtained. As probably a large proportion of this class may be referable to that of the artisans and labourers, the latter, as might be expected from the influences to which their children are most exposed, lose the largest proportion of their children under five years of age.

The same table shows that while the average age of the gentry was 36 years 5 months, and that of the tradespeople 37 years 3 months (a somewhat unusual advantage on the side of the latter class), the average age of the artisans and labourers was 30 years 1 month; the undescribed class being nearly the same. The deaths under five years being subtracted, the average age at death of the different classes was, respectively, 48 years 3 months, 49 years 4 months, 44 years 10 months, and 56 years 1 month; the tradespeople still preserving an advantage over the gentry, while the average age at death of the undescribed class amounts to 56 years 1 month. The average age at death of all classes for the seven years is 33 years 3 months.



EXTRACTS from REGISTRIES of DEATHS for the BRECON REGISTRATION DISTRICT ;  
Years, 7th June, 1837, to 7th June, 1844.

Class.	Total Deaths.			Average age at Death.			No. of Deaths from Consumption.		
	Under 5 Years.	5 Years and upwards.	All ages.	Under 5 Years.	5 Years and upwards.	At all Ages.	Under 5 Years.	5 Years and upwards.	All Ages.
Gentry, &c. . . . .	9	27	36	Yrs. Mo. 1 0	Yrs. Mo. 48 3	Yrs. Mo. 36 5	..	3	3
Tradesmen, &c. . . . .	66	195	261	1 6	49 4	37 3	4	55	59
Artisans, Labourers, &c. . . . .	167	326	493	1 3	44 10	30 1	15	102	117
Undescribed . . . . .	57	67	124	0 8	56 1	30 7	2	15	17
Paupers . . . . .	24	63	87	1 4	57 2	41 10	3	18	21
Totals . . . . .	323	678	1,001	1 ..	48 ..	33 3	24	193	217
Average . . . . .	..	..	..	1 3	48 0	33 3	..	..	..

Class.	No. of Deaths from Epidemic Diseases.			No. of Deaths from Diseases not stated.			No. of Deaths from other causes.		
	Under 5 Years.	5 Years and upwards.	All Ages.	Under 5 Years.	5 Years and upwards.	All Ages.	Under 5 Years.	5 Years and upwards.	All Ages.
Gentry, &c. . . . .	5	..	5	..	3	3	4	21	25
Tradesmen, &c. . . . .	28	17	45	3	10	13	31	113	144
Artisans, Labourers, &c. . . . .	74	36	110	4	19	23	74	169	243
Undescribed . . . . .	19	4	23	..	..	..	36	48	84
Paupers . . . . .	10	3	13	..	1	1	11	41	52
Totals . . . . .	136	60	196	7	33	40	156	392	548
Averages . . . . .	..	..	..	..	..	..	..	..	..

According to the same table, 1 in 4·6 of the total deaths was from consumption—1 in 12 among the gentry thus dying; 1 in 4·4 among the tradespeople; and 1 in 4·2 among the artisans and labourers; pointing out a considerable difference in the deaths under this head between the gentry and the two other classes, and little difference between the latter.

Of the total deaths 1 in 5·1 appear to have died from epidemic diseases. Of these, 1 in 7·2 was among the gentry (all under five years); 1 in 5·8 among the tradespeople; and 1 in 4·5 among the artisans and labourers. Combining consumption and epidemic diseases, deaths from these causes, as given among those of death noticed in the table (961), were 1 in about 2·3.

Of 997 deaths in the seven years, Mr. Davies has furnished the sub-joined statement as to the ages:—

1 to 2	2 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50
250	78	49	21	34	50	50	39	35	31	30

50 to 55	55 to 60	60 to 65	65 to 70	70 to 75	75 to 80	80 to 85	85 to 90	90 to 95	95 to 100	Above 100
28	31	38	53	55	40	44	23	12	3	3

Of these 997 deaths, which differ from the full returns for the time by only 4, nearly one-third (330) are of 50 years and upwards, 271 of 60 years and upwards, 180 of 70 years and upwards, and 85 of 80 years and upwards; affording an instance of a high rate of mortality, combined with numerous examples of advanced age. Many old persons are now to be seen at Brecon; and probably the returns will continue annually to exhibit numerous cases of persons living to advanced age in this town.



# R E P O R T

ON

## THE STATE OF LARGE TOWNS IN LANCASHIRE.

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By DR. LYON PLAYFAIR,

ONE OF THE COMMISSIONERS APPOINTED BY HER MAJESTY FOR INQUIRING INTO THE  
STATE OF LARGE TOWNS AND POPULOUS DISTRICTS IN ENGLAND AND WALES.

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# REPORT *on the* SANATORY CONDITION *of the* LARGE TOWNS *in* LANCASHIRE.

BY DR. LYON PLAYFAIR.

*To Her Majesty's Commissioners for Inquiring into the State of Large Towns and Populous Districts in England and Wales.*

MY LORDS AND GENTLEMEN,

1. IN accordance with the instructions received from you, and in pursuance of the terms of Her Majesty's Commission, I have instituted inquiries into the sanatory state of the large towns in the county of Lancashire. I have endeavoured to discharge the duties intrusted to me by examining those towns, not so much with a view to the introduction of local measures, as in order that I might obtain such a knowledge of their general condition as would furnish proper and sufficient data for consideration in the attempt to provide, by comprehensive enactments, for the removal of whatever evils may be found to exist.

2. The places I have selected, as illustrative of the general state of large towns in Lancashire, are Liverpool, Manchester, Preston, Bolton, Wigan, Ashton-under-Lyne, Bury, and Rochdale. I have also visited several of the smaller towns for the purpose of comparison. It was my wish to include the towns of Oldham and Blackburn in the inquiry; but the time at my disposal was too limited to enable me to undertake their examination.

3. In drawing up the Report which I have now the honour to present, I have thought it desirable so to arrange it that conclusions might be drawn from facts as they were presented to me, without at the same time complicating them with the numerous statistical details which I have collected, and which minutely illustrate the workings of many causes of disease and mortality.

I have, therefore, divided my Report into the following heads:—

1st. A consideration of the state of the towns as regards drainage, cleansing, supplies of water, building regulations, &c. according to returns made to me by local public bodies and acknowledged authorities in the several localities; and an examination of the various Local Acts and usages prevailing.

2nd. The consequences upon public health and morals, and the burdens on the community occasioned by the absence of sanatory regulations in the towns examined, as ascertained by inquiries instituted by myself with the aid of those conversant with the localities.

By thus dividing the Report you will be enabled to judge whether or not my conclusions are justly founded, and to remedy any errors of reasoning or of opinion into which I may have inadvertently fallen.

4. I have also ventured to submit for your consideration some valuable Reports and important evidence. I have done so because they illustrate general evils, to which I am desirous to direct your attention, and not because they describe local defects.

I would particularly beg to direct your attention to the very valuable and accurate Report on the State of Preston by the Rev. Mr. Clay and a Committee of Inhabitants appointed by the Mayor of that town.\* Mr. Clay is already favourably known to the public as author of several statistical Reports on the causes of crime, and Mr. Cartwright, who has afforded material assistance in the preparation of that Report, is a gentleman well acquainted with the localities of Preston. I would also beg to direct attention to the highly interesting Reports of Mr. Coulthart on Ashton-under-Lyne,\* of Mr. Robertson on the Statistics of Mortality in Manchester, of Mr. Holland on Chorlton upon Medlock,\* and of Mr. Holme on Liverpool.\*

In the Appendix will also be found the Report of Dr. Duncan\* on the State of Liverpool, a work which has already acquired for the author much local celebrity. Dr. Duncan has furnished his Report as evidence to the Commissioners; and I adduce it with more confidence, as a careful examination of that town has led me to the conviction that his statements have been made with great care and accuracy.

#### SEWERAGE.

5. The congregation of masses of beings into confined spaces necessarily causes the production of large quantities of animal and vegetable refuse. It has been shown by universal experience, that the accumulation of such refuse in the proximity of human habitations acts in a most destructive manner, either as an exciting, or as a predisposing cause of disease. I am most anxious in the present Report to avoid the discussion of all theoretical views on the subject of malaria, as it matters not for the purposes of legislation whether epidemics have their origin in the emanations of decaying organic matter, or whether these, by reducing the general tone of the system, render it more liable to the attack of a specific contagion. It is not disputed by those who hold the latter opinion, that decaying matter forms a most powerful predisposing cause to the attacks of disease; so that, in a practical point of view, it is of little consequence which of the two opinions represents most closely the truth; it being universally allowed, both by theorists and by practical men, that organic matter in a state of decay is extremely prejudicial to the health of animals exposed to its influence. This being admitted, it follows that the most careful means should be adopted for the removal of all refuse of towns beyond the sphere in which its noxious influence can be exerted; and that a system of drainage or sewerage which fails or falls short of the promotion of this desired object ought to be considered imperfect and inefficient.

6. In Manchester the natural drainage of the country is employed to carry off the artificial sewerage of the town. This, except as far as regards the loss of manure, would be an unexceptionable means of removing refuse, if the flow of the rivers constituting the natural drainage were perfectly free and uninterrupted; but this is far from being the case. Numerous "weirs" or dams for manufacturing purposes are erected in the course of the streams, and render stagnant the water polluted by the sewage of the town. E. W. Binney, Esq., a well-

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\* The Reports marked thus (\*) have already been published in the Appendix to the First Report of the Commissioners.



known geologist, points out this evil in a Report forwarded to you with other documents on the same subject:—

“The river Irwell, after having by its tributaries afforded drainage and sewerage to the towns of Bolton, Bury, Rochdale, and numerous other places, and been pent up in countless reservoirs and dams for manufacturing purposes, approaches Salford by the Adelphi in a pretty tolerable condition as to purity, inasmuch as small fish live in its waters; a very rare circumstance in any other of the streams. At the Adelphi is a high weir built across the river; after passing this impediment, it is polluted by the numerous works upon its banks in the eastern and south-eastern parts of Salford, and it receives the waters of the Irk at Hunt’s Bank, in a condition much worse than its own, in fact as filthy as waters well can be; thence the river flows sluggishly along the western part of Manchester to Hulme, where it receives a portion of the waters of the Medlock, and Shooter’s Brook, charged with the contents of the sewers of the eastern and southern parts of Manchester, and is then stopped at Throstle Nest by a dam across its stream. For many miles in its course towards Runcorn it emits offensive smells, and bubbles of light carburetted hydrogen gas, which rise to its surface.”

An inspection of the map attached to Mr. Binney’s evidence will illustrate the evils here alluded to. The Irk and Medlock are exposed to similar obstructions in their course, and aid in polluting the air of Manchester with emanations from the vast open cesspools thus created. The Duke of Bridgewater’s canal is supplied principally from the Medlock; it is fed also by the polluted waters of the river Tib, which, running through Manchester, receives the drainage of the houses built over it. A petition has been forwarded to the trustees of the canal, by the inhabitants of houses in its vicinity, complaining of the great injury to health and property from its putrid emanations, and praying for redress. The Cornbrook, a tributary to the Irwell, after running through several of the outer townships of Manchester, also flows into the canal, and aids in its pollution:—

“In all the streams above described,” says Mr. Binney, “an abundance of dead dogs and cats are to be seen in the various states of decomposition. Bubbles of gas, chiefly light carburetted hydrogen, rise up to the surface, and although offensive smells are met with at all times, they are by far the most annoying when the barometer has experienced a sudden depression, after being high for a considerable time previously. Sulphuretted hydrogen is the gas which chiefly causes the odour.”

In a Report on the state of Bristol by Sir Henry De la Beche and myself, the injurious effects of the polluted stream of the Frome, and of the stagnant waters of the Float, have been pointed out. The circumstances in the present case are similar, and the like results must follow.

7. The medical men in Manchester, whom I have consulted on this subject, are unanimously of opinion that the emanations arising from the putrid streams which wind their way sluggishly through the town are a cause of disease and mortality. I endeavoured by an analysis of the books kept at the fever ward to obtain specific information on this point, but the loose designations of the streets and residences of patients rendered it impossible to attain even an approximation to the truth.

Mr. Leigh, a surgeon intimately acquainted with the town, describes these evils in the following portion of evidence:—

“As an officer of the Manchester Infirmary, from six to nine years ago, it was within the range of my duties to visit them almost daily, and I am enabled to state positively, that epidemics were exceedingly prevalent and fatal in such localities. There are but two rivers, whose banks are much dwelt upon here, the Irk and the Medlock. My observations of disease have been more particularly confined to the vicinity of these, and of the Bridgewater Canal at Gaythorn. The banks of the Irk, forming the district of Long Millgate, were once particularly notorious as the constant seat of disease, and some of the courts there situated were almost depopulated during the prevalence of cholera. The ravages of that disease were so great on the banks of these putrid streams, that the attention of the local authorities was attracted, and one court (Allen’s Court) in Long Millgate was entirely pulled down, and the ground laid open.”

Dr. Gaulter, in his elaborate work on the progress of cholera in Manchester, refers particularly to the circumstance, that “One of the most considerable sewers of the town, that of Long Millgate, and Hanover-street, empties itself into the Irk at no great distance from Allen’s Court, *and just above a dam, which has the effect of detaining the contents of the sewer, and throwing them in the direction of the court.*” He states also, as well worthy of observation, that “the attack was limited to the row of houses on the river’s edge, and that not a single case occurred in any of the houses which occupied the elevated brow of the hill above, though the area between them is very small.” He also shows that the inhabitants of several streets parallel to the Rochdale Canal were considerable sufferers, although on the whole, the cholera raged chiefly in the filthy districts of Deansgate and Ancoats, which are distant from the rivers, but abounded in filth of every description.

Dr. Howard states that he has “occasionally noticed a greater than average of cases of fever, diarrhœa, and dysentery in those low situations, which are liable to be inundated during floods;” and he considers that the absence of more marked effects from the putrid streams, is to be attributed to the current of air, which the open space of a river permits to circulate, and that this circulation carries off the emanations in ordinary circumstances from the houses in their immediate vicinity.

The dams on these streams are not only injurious by preventing the rapid escape of refuse poured into the rivers by sewers, but they also act injuriously in several instances, by preventing the improvement of districts notoriously unhealthy, from the absence of efficient drainage. Mr. Alderman Hopkins, the Chairman to the Committee of Sewers, states that the great impediment to the drainage and improvement of Little Ireland, is a dam thrown across the river, belonging to a mill in that locality. When water-power was of importance in the driving of machinery, these dams were of course necessary and indispensable appendages to the proper manufactures of the place. But now, with the introduction of steam-power, their value has in many instances diminished; and it is a question worthy of *local* consideration, whether in several cases they could not be dispensed with by the introduction of other modes of obtaining a sufficient depth of water. And it becomes still more worthy of local consideration, whether the manure utterly lost to the town by its projection into the rivers, might not, with great advantage to health and to economy, be applied to purposes of irrigation, by the introduction of a new system of sewerage, which would



relieve these otherwise polluted streams from a large proportion of their filth, in some such manner as described in Mr. Holland's report on Chorlton, and in Mr. Corbett's evidence. (First Rep., Vol. I. p. 214; Vol. II. p. 327.)

8. A committee of the town-council of Manchester, termed "The Paving and Soughing (sewering) Committee," possess jurisdiction over the sewerage of that town. By two local Acts, the Commissioners, or the committee of the town-council (the powers of the Commissioners having been vested in the latter body), exercise the power of paving and sewerage streets, when these shall have been built on to the extent of one-half.\* A clause in the statute enacts that six months' notice of their intention to do so must be given to each owner or occupier in the street. There is no special rate levied for this purpose, each owner or occupier having to pay, according to the frontage of his house or property, the cost incurred in the improvement. If any such owner or occupier shall neglect to pay these costs within 14 days after they are demanded by or on behalf of the committee, he may be proceeded against by distress and sale of his goods. An exception is made when the cost of improvement is greater than the fair annual value of the property charged. This prompt mode of reimbursing the committee is attended with very serious evils, as shown by various witnesses. In many cases, the cost of improvement amounts to more than the yearly rental of the property. Mr. Holland describes an instance of property about to be improved, over which he holds a mortgage; the cost of improvement in this case amounts to the rental of the property for two years; so that during that time he is deprived of interest on the mortgage, making it, therefore, a forced loan on his part, for which he receives no advantage. He instances also a distressing case of a widow lady in Chorlton, whose entire income, derived from rents of houses, was absorbed, for three years, in reimbursing the cost of this compulsory improvement. Mr. Smith, of Preston (First Rep., Vol. II. p. 153), mentions a similar case which occurred to a widow lady of his acquaintance: "The sewerage and paving swallowed up the rent for nearly two years, and as she had only the life-interest of the property, she often complained to me how severely this sudden call distressed her; she died at the end of the two years." Mr. Corbett, of Manchester (First Rep., Vol. II. p. 328), states that instances have occurred in his own case, in which from three to four years' rental has been absorbed in reimbursing the cost of improvement. This evil is strongly alluded to by Mr. Wroe, the late Secretary to the Paving and Soughing Committee.

"In what period, when you sewer a street in Manchester, do you levy the expense back again?—Usually in about 15 months.

"Must not such a mode of levying, and within so short a time, be very severely oppressive?—Very frequently dreadfully so, especially on poor persons and widows, who have just sufficient to keep them. It is extremely distressing to see poor widows, who have only a life interest in the property, and perhaps not able to mortgage it, come and plead to get time.

"Has the demand for improvement in many cases absorbed the whole rent?—We very frequently find that the expense of paving and soughing comes to more than the yearly rental."

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\* By an Act of last Session, power is given to require the improvements to be made as soon as any part of a street is laid out for building.

The committee have on this account felt reluctant to recover the costs by the prompt means which the law enables them to exercise. Hence practical difficulties have occurred, which are explained in the following extract from the evidence of Mr. Alderman Hopkins, the chairman of the committee, relative to the difficulties encountered in the prosecution of its labours:—

“The committee have for some considerable time past had a fund of 10,000*l.* placed at their disposal, to enable them to proceed with the sewer-ing and paving of those streets within the township of Manchester, which are not repairable by the public.

“By the local Acts of Parliament under which the business of the town-ship is conducted, when one half of any of the streets is built upon or inclosed, they may be sewered and paved by the committee, and when completed, the money expended may be recovered from the owners, in order that it may be used in a similar way in other streets coming under the provisions of the Acts. But practical difficulties have been experienced in recovering the money thus expended, resulting principally from equivocal ownership of property. And the committee soon discovered that the sum of money entrusted to them for sewer-ing and paving the whole township was sunk in a small number of the streets; and the recovery of it from the owners has been so slow, that the committee have been unable to do more work in a year than, say, 20 or 30 streets, requiring an outlay of, say, from 12,000*l.* to 15,000*l.*, although more than 500 streets, but many of them small ones, are in a condition to be proceeded with under the provisions of the Act.

“The committee have felt reluctant to take those prompt means which the law has provided to recover from the owners the money due by them; hence a general delay has arisen in obtaining repayment, and there are many cases where land is uncovered with buildings and not used for beneficial purposes, and the legal owners are poor; whilst in other cases the buildings are unoccupied, and in numerous cases where they are occupied, the owners are so poor, that the money is obtainable only by small instalments; and frequently the committee, in accordance with a provision in one of the local Acts, have to collect the greater part or the whole of the rents from the tenants. These and other circumstances prevent them from obtaining the money they have expended in such time as would enable them to sewer and pave the township within a moderate period.”

The town-council have the power to allow owners three years to repay the expenses; but this provision has never been acted upon, for, as Mr. Hopkins remarks, “It would evidently soon lock up all the funds which the committee have at their disposal, when their further proceeding would be arrested.”

With these difficulties to encounter, too much praise cannot be given to the committee for the great improvements carried into execution by them. Since 1830, more than 32 miles of sewers have been constructed. The total number of streets sewered and paved, or “on the town’s books,” is 480; but there are still 450 unpaved and unsewered streets of sufficient size to come under the operation of the Act. Under the present law these streets cannot be proceeded with rapidly, even on the supposition that money were borrowed by the town-council on the security of the rates. The provisions of the law relating to paving and sewer-ing are so vague, that there is not sufficient security to the rate-payers that the cost of improvement would be repaid by the owners of property without the tedious and uncertain result of a legal process.

9. Details respecting the dimensions and forms of the sewers are



given in the surveyor's evidence. It may be sufficient here to state that the form of the larger sewers is elliptical; and that of the smaller, a semicircular bottom with vertical walls; and that the price averages, according to the statement of the surveyor, 15*s.* per lineal yard. The smallest size allowed for a private drain is 15 inches high and 12 inches wide, the cost of which, including all expenses, is 3*s.* 4*d.* per lineal foot.

I shall advert to the effect of this form of sewer in diminishing the facilities for the connection of houses with the public sewers, when I come to the consideration of the favourable results upon the health of the town, and the decreased mortality produced by the improvements effected. It may here be sufficient to state, that these private drains are unnecessarily large and costly, when compared with those approved by the experience of London; and even London sewers are stated by competent witnesses to be larger than requisite.

10. The labours of the committee have not by any means been confined to the more wealthy parts of the town, the poor districts having attracted a large, if not the largest, share of their attention. And their labours have not been in vain: Dr. Howard and Mr. Leigh, who were intimately acquainted with these districts some years since, from their connection with the infirmary, kindly agreed to inspect the worst-conditioned localities with a view to report upon their present state. They both express their astonishment at the better appearance of the inhabitants, and of the physical condition of these districts, since the time they were accustomed to visit them. A few years back they were unpaved and unsewered, "and in winter the streets in the district of Angel Meadow were trod up into a thick mud 12 or 14 inches deep, and were almost impassable: the cellars of the houses were flooded, and influenza, cholera, or fever, prevailed in succession the year round. The wards of the hospital were filled with cases from this district. Within the last few years, however, almost the whole of the streets have been put into thorough repair by paving and sewerage; the footways have been well flagged, and the cellars protected from the inundations to which they were formerly subject." But they show that there are still many evils connected with this district. "In one part a chandlery sends forth its disgusting effluvia, pigsties are dotted up and down, and heaps of filth are poured down a precipitous clay bank to lie and rot."

Dr. Howard and Mr. Leigh visited carefully all the worst districts of the town in which epidemics had formerly prevailed and cholera raged, and they state their general impression as follows:—

"These localities are those in which the greatest amount of disease was wont to prevail, and the condition of which is yet such as to attract attention. Still, when compared with the appearance they presented seven or eight years ago, their condition would scarcely be censured by those whose recollections of them extended so far back. Within that period they have nearly all been excellently paved and sewerage."

Mr. Bennett, a surgeon and registrar of deaths in the Ancoats district, in alluding to the health of his district not being impaired in the late years of severe distress, states that the reason is "because the drainage, paving, &c., is so much improved."

Such is the testimony of medical men now and formerly acquainted

with the localities. But still there are vast improvements to be made before these districts can be pronounced to be in a proper sanitary condition. These improvements are intimately connected with drainage and paving: but before they can be understood, other points must be discussed; and before they can be introduced, other laws must come into operation.

The public sewers in Manchester have a considerable inclination (1 in 72 inches), although the natural facilities for drainage are worse than in most towns of Lancashire. This inclination prevents, in a great measure, the accumulation of large deposits in the sewers; but it is undeniable that very offensive smells frequently arise through the eyes or "grids." These exhalations are perhaps more sensible than in other towns, from the quantity of hot water discharged by the mills. Still this merely forms an argument for a more rigid and scrupulous attention to the cleansing of the sewers; and the committee of the Manchester town-council might, with great advantage, follow the example of the Commissioners in some parts of London, by introducing the flushing system, and better ventilation into the sewers which most require these remedies. The amount of rain which falls in Manchester (36 inches annually) is so considerable, and the quantity of water turned off from the factories is so great, that the system of flushing might be made more effective there than it is even in the Holborn and Finsbury districts in London; but until the copious supplies of water thus furnished are made fully available, any satisfactory working of the sewerage must not be expected. The absence of large accumulations of deposit is not a sufficient proof that sewerage is in a state of perfection. The existence of emanations of any kind (conveniently and generally by all Commissioners of Sewers attributed to the escape of gas refuse) is a sufficient indication that a sewer is not in a state of purity sufficient to prevent it being injurious to the district in which it is placed. The true mode of remedying the evils is to remove their cause, and not merely to mask them by a system of traps. The latter are most useful, and, in the present state of sewerage, indispensable; but the true and only proper method is to remove the causes of grievance by a more efficient system of cleansing; and to provide for the ventilation of the sewers in some such manner as has been proposed by Dr. Reid and other competent authorities on this subject.

12. Private drains connecting houses with main sewers are far from being so general as is to be desired. The committee do not possess any power to enforce their construction; so that, from the cupidity of the landlord, the negligence of the occupiers, or the unnecessary size and cost of the drains usually formed, the matter is too frequently unattended to. In few instances only are private drains furnished with traps; and Mr. Francis, the superintendent of sewers, states that their proper cleansing is much neglected.

13. The out-townships of Manchester are greatly deficient in drainage: these are under the management of separate committees of the town-council, and unconnected with the paving and scavenging committee of the town itself; so that the experience and knowledge acquired by the latter body are not made available for the management of the out-townships; an evil which I shall afterwards consider in detail.



14. Salford, though popularly considered a part of Manchester, is a separate borough, governed under powers distinct and different from those which regulate the latter town. The sewerage of Salford is placed under the authority of the surveyors of highways, and of the Commissioners under the Salford Improvement Act. This Act confers powers (similar to those described in the case of Manchester) for paving and sewerage streets at the expense of the owner or occupiers of the houses and property situated therein. Although conferring extensive and important powers, it has not been actively carried into operation. In the first eleven years (1832 to 1842 inclusive), the total number of streets sewerage amounted to 47, measuring 8983 yards in length, or an annual average of only  $4\frac{1}{4}$  streets, or  $816\frac{3}{4}$  yards. In reference to the past year, more vigour is perceptible; the number of streets being 21, measuring 2630 yards in length; and the Commissioners announce their intention of commencing the sewerage of 39 streets in the following spring. Thus the aggregate length of sewers constructed since 1832, in the large borough of Salford, is only 11,613 yards, or only about one-fifth the length of sewers, and one-seventh the number of streets finished in Manchester under a similar Act during the same period. The Salford Act has not been thus inoperative owing to the absence of any necessity for exercising its powers; on the contrary, the sewerage of the town is in a most objectionable state; but the causes which have retarded improvement in Manchester have also existed in Salford. The surveyor of sewers in Salford states that—

“The main obstacle to the efficient exercise of the powers granted by the Salford Improvement Act arises from the fact that the tenements in the majority of unsewered streets are of an inferior description, and belong generally to proprietors of limited means, and from the difficulties consequent thereupon of obtaining repayment of the needful expenses. It will be observed by the Act, that when the Commissioners take a street in hand it is their duty, not only to sewer, but to flag, pave, and otherwise to level the same, the entire expenses whereof are chargeable upon the respective owners at once, as soon as the work is completed; and it is found that the average of the total of these expenses, take one year with another, is about 1*l.* per lineal foot of street. In many cases the payment of such expenses, though for a permanent improvement, is attended with so much inconvenience and hardship, that it appears the Commissioners have been obliged, by the force of circumstances, to allow balances arising from claims of this nature to lie over for some years beyond the period limited by the Act. It is submitted, therefore, under these circumstances, that the operation of the Commissioners would be rendered more efficient if assistance, in the form of loans, were rendered to them, in respect to the expenses in question; such loans being repayable by annual instalments, with interest, within 20 years.”

The same witness states that the dimensions of sewers in Salford are 3 feet 8 inches by 1 foot 10 inches, inside measure; the walls of brick 9 inches thick, set in Ardwick mortar, and covered with Rochdale flag, the average cost per lineal foot being 5*s.* 6*d.* The main sewers previously constructed were of the same form, but only 3 feet high. The size of the house-drains is 15 inches high by 12 inches wide; the average cost being 2*s.* 6*d.* per lineal foot. Some of the older sewers are square; and he states, “with respect to the house-drains, they are generally of inadequate size and bad construction.”

The powers of the Salford Improvement Act do not extend to the

out-townships of Pendleton and Broughton, or to the portion of Pendlebury comprised in the Salford Union. In these there are a few public and a few private sewers, but nothing like a general or systematic drainage. The sewerage is, therefore, lamentably defective; and many complaints are justly made of localities, such as the vicinity of the Black Ditch in Pendleton, Charlestown, Great Clowes-street in Broughton, the cottages adjoining the mills in the same township, and several places in Pendlebury. The effects of this deficient drainage are too perceptible in the epidemics which frequently arise in these neighbourhoods, and which in some cases have proved peculiarly severe.

In Salford, there exist no powers to compel the owners or occupiers of houses to connect them by drains with the sewers of the street; so that this connexion is, to a great extent, neglected, or, when accomplished, is generally effected without precautions as to their cleansing, or to the prevention of the entrance of emanations from public sewers.

15. An Act similar to those of Manchester and Salford is in operation in Little Bolton, a portion of the town of Bolton. Its compulsory powers have been attended with very beneficial effects, which are particularly observable in the striking contrast between this and the adjoining township of Great Bolton, the Sewerage Act of which seems to be quite inoperative. Both the outward appearance of the streets and the cleanliness of the interior of the houses are very different in these two townships.

Manchester, Salford, and Little Bolton are the only towns I have visited possessing Improvement Acts with compulsory powers. In other towns sewers are constructed, either under Commissioners appointed for that purpose, out of general sewerage rates, or they are made by the surveyors of highways under the general Highway Act. I shall consider first those towns in which the former system prevails.

16. In Liverpool, the sewerage rates are placed under the control of 24 Commissioners, 15 of whom are owners and occupiers of property rated to the relief of the poor at a sum not less than 50*l.* per annum, and 9 are elected out of the town council. One-third of the Commissioners retire annually, but are re-eligible. Mr. Rennie wrote a Report on the state of the Sewerage of Liverpool in 1816, in which he states that "No town in the British dominions is better situated than the town of Liverpool for a complete system of sewers." Mr. Rennie, in his Report, points out the necessity for making the outlets of the sewers so as to render practicable their discharge at all times of the tide, and, as far as possible, to render them independent of the basins. In 1829, Mr. Foster proposed a modification of Mr. Rennie's plan; and this having been approved, was carried into effect.

Mr. Deane, the clerk to the Commissioners, describes their operations as follows:—"The sewers built by the Commissioners under the authority of the 11th Geo. IV., at a cost of nearly 100,000*l.*, are 33,440 yards, or 19 miles in length; and the sewers now in the course of erection, under the authority of 5 Victoria, are 3748 yards."

Thus, up to the present time, the Commissioners have constructed 19 miles of sewers, and are constructing 2 miles in addition. Competent witnesses examined on this point spoke favourably of the activity with which the works of the Commissioners have proceeded. Certainly, when we compare the length of sewers built in the smaller town



of Manchester, during the same period (32 miles 77 yards), we are inclined to be disappointed that further progress has not been made in the sewerage of Liverpool. This is not to be ascribed to any apathy on the part of the Commissioners, but to the difference of the system, by which the expenses of sewers are obtained. The sewerage of Liverpool is paid for by general rate; and hence the public do not feel disposed to pay a high rate for what they do not feel to be their immediate personal benefit. In Manchester, the case is otherwise; A. does not pay for improvements to the property of his neighbour or townsman B., but is called upon to reimburse the expenses incurred in the permanent improvement of his own property only. In Liverpool, the sewerage, if still conducted on the present system of general rates, will be a work of considerable time.

17. Whatever cause for dissatisfaction may exist with regard to the extent of sewers constructed, there is much more reason to regret that the localities selected by the Commissioners for their operations have been almost exclusively those in which the richer members of the community reside. Dr. Duncan states—

“The number of inhabited streets in the parish I estimate at 566, measuring 101,290 yards, or about  $57\frac{1}{2}$  miles; of which 235, measuring  $25\frac{1}{2}$  miles are either wholly or partially sewered. But these  $25\frac{1}{2}$  miles are very unequally divided among the different classes of the inhabitants; for, while of 243 streets, measuring about 20 miles, inhabited chiefly by the working population, only 56, measuring about 4 miles, are sewered, the proportion of sewerage chiefly occupied by other classes of society is 179 streets, measuring about  $21\frac{1}{2}$  miles, out of 323 streets measuring  $37\frac{1}{2}$  miles.”

18. I am inclined to impute this circumstance to the system of constructing sewers on general rates. The owners of streets where the property is of a valuable description, contributing, therefore, a large proportion to the rates, naturally expect that their property should be the first improved; but in an enlarged and enlightened policy, the propriety of such expectations is very questionable. The great object of sewerage is to remove the refuse, which accumulates wherever human beings congregate together. It has been decisively proved, and further proofs will be afforded in this Report, that the absence of means for removing such refuse is the cause of much disease and great mortality. The rich are not exposed to this evil to the same extent as the poorer classes; the latter congregate more closely together, and have not the means or opportunity of employing the expensive modes resorted to by the higher classes of society for removing filth and ensuring cleanliness, either in their dwellings or vicinity. The absence of facilities for cleansing in the houses of the upper classes, therefore, only entails an additional expenditure, which is always incurred. Not so with the poorer classes; the absence of such facilities with them forms an insurmountable barrier to cleanliness, and they necessarily acquire those filthy habits which entail upon them all the concomitant evils of immorality, disease, and death. The results inevitably flowing from this state of things cause an immense burden upon public charity, as will be more fully shown, when I consider the expense of sickness in Liverpool. At present, it may be sufficient to state, that the cost of the *excess* of sickness and of death in the parish of Liverpool over the amount of sickness and death in other towns of an average mor-

talities, is much more per annum than the whole amount of money expended in the sewerage of the town. This burden to the community is not imposed by localities inhabited by the wealthy classes, but by those districts which hitherto have been too much overlooked in the endeavour to promote structural improvements. The mere drainage of such localities might not remove, but would materially relieve, this enormous pecuniary burden, to say nothing of the alleviations of more momentous evils.

19. I enter into these considerations, not with any view to impute blame to the Commissioners, but to point out the inefficiency of the system which they are called upon to conduct. The sum of 100,000*l.*, though much less than the annual cost of the excess of mortality in Liverpool, is a large sum to obtain and to expend from general rates. But in Manchester, where the system is different, each owner paying for the permanent improvement of his own property, a larger sum than this has been expended without any general demand on the rates. In the latter town also, owing, as I have stated, to the difference of the system, the very reverse procedure to that of Liverpool has been adopted, viz. the improving the poorer, instead of the richer, districts of the town; with what effect has already been pointed out, and will be seen more fully hereafter.

20. The Liverpool Commissioners are now engaged in sewerage some of the back or poorer streets, and it is to be hoped that their labours will for some time be principally directed to such districts. That these stand in great need of sewerage, their filthy state and excessive mortality abundantly testify. Mr. Holme, an eminent builder in Liverpool, thus describes the evils complained of:—

“Notwithstanding the Commissioners of Sewers have expended above 100,000*l.* in new sewers and paving during the last few years, very much remains to be done, even in the principal thoroughfares, before our sewerage can be considered accomplished . . . . In numberless instances, courts and alleys have been formed without any declination for the discharge of surface-water. Many are laid without channels; and while the solid refuse thrown upon them rots on the surface, the liquid matter is absorbed, and much of it finds its way into the inhabited cellars of the courts. The north end of the town is full of pits of stagnant water, which form so many receptacles for the putrid matter that is constantly thrown into them, such as dead animals, the drainage from starch and other manufactories; and, in hot weather, the stench from these places is frequently intolerable. The whole of the north end of the town being, as I have before described, a bed of clay, these poisonous pools are never lessened, except by evaporation; and from these, and the imperfect drainage, and other causes to which I shall advert, instead of being surprised at the mortality of Liverpool, I am surprised that the mortality, taking all things into consideration, is so exceedingly small.”

This witness, whose testimony is entitled to the highest respect, suggests other important considerations with respect to the drainage of Liverpool.

As respects private drains, “there are thousands of houses,” says Mr. Holme, “and hundreds of courts in this town without a single drain of any description; and I never hail anything with greater delight than I do a violent tempest, or a terrific thunder-storm, accompanied by a heavy rain; for these are the only scavengers that thousands



have had to cleanse away the impurities and filth in which they live, or rather exist." These portions of the evidence of Mr. Holme having been recited to Mr. Aspinall, the chairman of the Health Committee appointed under the "Health of the Town Act," he entirely coincided with the former gentleman's views.

Mr. Holme goes on to say:—"It is clear that we cannot have a perfect system of *private*, till we have a perfect system of *public* sewers; and, by reason of the great expense incurred in the latter, it must necessarily be a work of time before all can be accomplished. There must be arteries before we can have a free circulation through the veins."

21. But even when public sewers exist, there is a great obstacle to the introduction of private drains, by a regulation peculiar to Liverpool. The acknowledged object of sewers is to remove refuse from houses; and yet, with a strange inconsistency of purpose, the Improvement Act gives power to the Commissioners of Sewers in Liverpool to prevent the overflow of water-closets from passing into sewers, and the consequence of this pernicious rule is, as Mr. Holme remarks:—"That nearly all the water-closets are discharged into open ash-pits or cess-pools, impregnating the atmosphere in numerous places, and exposing that matter to the surface, and to the decomposing effects of the atmosphere, which ought to be carried by the public sewers into the main artery of the river, and the air is thus tainted, through the mistaken views of those whose function it especially is to provide the means of carrying off the effluvia."

It is quite conceivable that without a system of flushing, the Commissioners should object to the connection of common necessities with public sewers; for the former being generally connected with ash-pits, the ashes and other refuse would soon obstruct the sewers. But no such obstructions could ensue from the overflow of the soil-pipe of a water-closet. The fact, that in all large towns the communication of water-closets with sewers is permitted, ought to be to the Commissioners a sufficient guarantee for the propriety of such communication.

Mr. Weightman, the surveyor of the Commissioners, in a most judicious report, made after his inspection of the sewers of the Holborn and Finsbury districts, has recommended to the Board at Liverpool, to allow the connection of water-closets with sewers, and to curtail the dimensions of private-house drains to a diameter of 12 inches. He has also drawn attention to the importance of joining sewers on the curvilinear plan, instead of, as formerly, at right angles; and he has strongly recommended the introduction of the flushing system into the sewers which possess small inclination, and a more perfect system of ventilation for all. It is earnestly to be desired that his judicious suggestions should be adopted.

22. Before leaving the subject of the Liverpool Sewers, I would beg to remark on their cost as compared to those of some other towns in Lancashire. In Ashton-under-Lyne the expense of constructing sewers, *i. e.* of excavating, building, relaying, and procuring materials, is 6s. 6d. per lineal yard. In Manchester, the sum, according to Mr. Francis, is on the average 15s. per lineal yard. The Liverpool Commissioners state their price to be from 9s. to 13s. per foot, or an average of 33s. per yard. But when we estimate the amount of work performed by

the Commissioners, according to their own statements, and the amount of money expended in the execution of this work, the actual expense will be seen to be considerably greater. The Commissioners state that they have constructed 33,440 yards, at an expense of 100,000*l*. The cause of this excessive expense is explained by Mr. Aspinall, in the following portion of evidence:—

“In the neighbouring town of Manchester, the cost of sewers, that is, of excavating, building, relaying, and procuring materials, is 15*s*. per lineal yard. The cost of sewers in Liverpool is estimated at 33*s*. per lineal yard. Are you aware of the cause of the difference in price?—After some of our sewers have been made, we have been obliged to take them up and enlarge them. There is a sewer in Church-street, made a few years ago, and so many sewers have been put into that sewer, that it was not sufficiently large and sufficiently deep.

“Therefore this enormously increased expense is owing to a deficient system of scientific sewerage at the outset, to their not having taken a sufficiently large basin for operations, and to the work having been deficiently executed; and all those unscientific arrangements for the sewerage are now to be remedied at an enormous cost?—In one or two instances.

“The sewers in Manchester are generally larger than has been found necessary by experience in London, the reason assigned being that this increased size is necessary on account of the quantity of water discharged from the manufactories in Manchester. Is there any similar reason for increasing so materially the size and expensiveness of the Liverpool sewers?—Generally, no.

“From the experience of Manchester, 19 miles of sewers could have been constructed for 25,080*l*., or, according to the estimate of the average expense of construction in Liverpool, for 55,176*l*.; but as the Liverpool Commissioners have expended 100,000*l*. upon the construction of their sewers, it appears that the actual expense of construction in Liverpool is nearly double the estimated amount of 33*s*. per lineal yard, or nearly quadruple the amount for which it is stated in evidence that efficient sewers are constructed in Manchester. Can you state the reason for the very great difference between the estimated and the actual expense of construction in Liverpool?—The sewers stated to be executed in Manchester at an average cost of 15*s*. per yard, vary in size from 15 inches by 12 inches to 42 inches by 24 inches, and of the latter size only one has been executed between June, 1838, and May, 1844, and it appears that during that period no sewers larger than 42 inches by 24 inches have been constructed; but that between 1836 and 1838 one was built 60 inches by 36 inches, at a cost of 41*s*. per yard; and two, 72 inches by 36 inches, at a cost of 40*s*. 5*d*. per yard. The average price stated for sewers in Liverpool, viz., 33*s*. per yard, is for sewers varying from 42 inches by 36 inches to 48 inches by 36 inches, made of sufficient depth to drain the cellars. The greater part of the 19 miles of sewers made between 1829 and 1840, were main sewers, encircling the borough, or acting as great arteries to receive the subsidiary sewers, since made, and now making, and varied in size from 60 inches by 36 inches to 72 inches by 54 inches; the great north tunnel, running from Crown-street to Beacon’s-gutter, was 3 miles 320 yards long, and of the above sizes, and cost about 58*s*. per yard; and such was the size of the Parliament-street, 2400 yards long; the Dale-street sewer, 1800 yards long; the Hanover-street sewer, 2400 yards long, and many others; and few sewers are constructed less than 46 inches by 30 inches, which enables men to enter and clean them.”

Thus part of the great excess of expenditure has been owing to the want of proper surveys, and good systematic and scientific arrangements at the outset; although it is probable that much of it was neces-



sary on account of the great length of main sewers to be constructed, and the few outlets for them, when compared with Manchester, which is intersected by four rivers, constituting in themselves main sewers, which obviate the necessity for the construction of others so large or so extended as those required in Liverpool.

23. The township of Great Bolton, constituting the most important division of Bolton, possesses Trustees of Sewers and Improvements, whose powers are wholly inadequate to the preservation of cleanliness in the town. The sewerage of Great Bolton is, therefore, in a most deplorable state; and there being no regulations for systematic drainage, very few sewers have been built of late years. The trustees acting under the Great Bolton Act require that sufficient drains shall be made in streets before they undertake their repair. These drains are to be constructed by the owners of property in the street, without regulations of any kind, and hence there is an utter disregard of scientific principles in their construction. Some are square, others round; in fact, they are of any shape that happens to coincide with the views of the builder: they have their junctions at right angles; and the filth, which from the badness of their form accumulates in them, is removed, as best it may be, by the showers of heaven. Many important streets in Great Bolton are destitute of sewers, and its out-districts are almost wholly unprovided with them. A good system of private drainage cannot be expected where public sewerage is so lamentably defective. This town contrasts strongly with the neighbouring township of Little Bolton, which, as before stated, has a local Act similar to that in operation in Manchester. The township of Little Bolton possesses the cleanliness afforded by a system of sewerage comparatively good, though absolutely unscientific; the township of Great Bolton can be compared in filthiness only to the poorer districts of Liverpool, and to those of Wigan and Rochdale.

The sewers of Bolton empty themselves into the small rivers which wind sluggishly through the town, and yield to the air, in their passage, the most offensive emanations.

24. Preston, distinguished for the rural beauty of its town, and for the activity of its authorities, has been strangely negligent in its endeavours to procure a systematic sewerage. An inspection of the map transmitted to the Commission with the Report on Preston will sufficiently indicate this fact. Mr. Park, the steward to the Corporation, states that "There are no specific regulations for draining the town or its vicinity. A large extent of the town is entirely without under-drains or sewers, the water from the houses flowing along the channels upon the surface."

But even where proper sewers exist, there is a great want in the appreciation of their advantages. The Rev. Mr. Clay states that "There is only one street in the town that can boast any proper combination of house and street drainage, now admitted to be essential to the character of a well-ordered town. Almost all the new streets in Preston have been planned and built without any attention to drainage and sewerage; and it is evident that legislative interference is needed to compel due provision for these subjects."

The sewers in Preston are well constructed; both old and new

sewers are circular in form, and built of bricks. Their prices, including every expense in their construction, are as follows :—

	s.	d.	
4 feet in diameter . . .	14	6	per lineal yard.
3 feet in diameter . . .	12	0	ditto
2 feet 6 in. diameter . . .	7	6	ditto
1 foot 6 in. diameter . . .	6	9	ditto

The sewers, having a good inclination, are generally free from deposit, and discharge their contents into the river. Part of their refuse is employed, to a small extent, in irrigating land in the vicinity ; but the land irrigated is too near the town, and the sewage-water is supplied in such excessive quantities that the offensive effluvia arising from it is found to be a considerable nuisance.

The sewerage of Preston is, therefore, far from complete. Mr. Park states that “There are in many of the worst districts quantities of liquid refuse which stagnates in the ditches near, and bog-holes attached to, the cottages, and which is a great nuisance to the whole neighbourhood. There are also, upon portions of land in different parts of the town, stagnant pools of water, which are allowed to sink into the subsoil, or evaporate, as the case may be.”

25. In Ashton-under-Lyne the sewerage of the town is intrusted to Commissioners of Police, who generally construct the sewers according to the established plans of the lord of the manor, the Earl of Stamford and Warrington. The leases from his Lordship contain a covenant that the tenants shall sewer the streets co-extensive with their properties ; and, as Mr. Coulthart remarks, “It only requires the directions of his Lordship’s agents to have every portion of the town, let on lease, drained in an efficient and proper manner.”

With respect to the extent of sewerage in Ashton much yet remains to be done. “There are about 14 miles of streets in the town, nearly five of which are properly sewered with main-drains, about four partially sewered with branch or house drains, and the remaining five miles scarcely sewered at all.”

The cost of construction of sewers in Ashton is only 6s. 6d. per lineal yard ; the soil is gravelly and easily excavated ; the expense of private drains in that town is only 6d. per lineal foot. The sections of the sewers, and their prices, are detailed in Mr. Coulthart’s Report.

26. In Rochdale, Commissioners of Police, appointed under a local Act (6 Geo. IV.), are enabled to repair sewers in streets dedicated to the public, without being empowered to construct new sewers. There are no arrangements for systematic drainage. A committee of the inhabitants of Rochdale, the Reverend the Vicar presiding, state that “There are no regulations of a general character for draining the town. In many parts of the new town the streets, courts, and alleys are uneven and unpaved, and favourable to the retention of stagnant moisture, and accumulations of refuse thrown from the houses. There are stagnant pools and ditches contiguous to the dwellings. The committee consider the want of power of enforcing arrangements for under-drainage a great evil, and hope the Legislature will provide a remedy. There are good sewers in some of the main streets.”



The river Roach, which passes through Rochdale with a rapid current, carries away the refuse of the few sewers which enter with an abundant fall. In fact, Rochdale, like most other towns in Lancashire, is admirably situated for drainage, if its natural facilities were attended to; but this is far from being the case. The few sewers that exist are constructed on the old forms without scientific principles. In the new parts of the town there is not even an attempt at sewerage, and their filthy state is in the highest degree disreputable, as I shall have occasion to show in a future part of this Report.

27. In Wigan the surveyors of highways possess the power of constructing new sewers, and of keeping old ones in repair. But, as usually is the case with changing and unpaid officers wanting in professional knowledge and experience, the works executed by them are done without any regard to a general system, and without reference to the improvements effected in other towns. The main streets in Wigan are drained, but the form of the sewers is square; though the evil of accumulations arising from this shape is, in a great measure, prevented by their natural declivity. Mr. Eckersley, the late mayor of Wigan, describes the state of sewerage in that town in the following words:—

“There are no regulations for draining the town. The general declivity of the streets is favourable for the discharge of surface water. There are some streets, which, being unpaved and undrained, retain wet and refuse thrown from the houses. There are no arrangements for under drainage; but the main streets of the town have private sewers. There are many stagnant pools and open ditches in the town. The sectional form of the main sewers is 16 inches square, made of stone, and their cost is about 3s. per yard; the branch house-drains are irregular in every respect.”

The want of drainage in the lower parts of Wigan is truly lamentable. I visited them during heavy rain, when the impermeable clay, on which some of them are situated, prevented the absorption of moisture, and indicated most plainly the nature and extent of the evil. The smells arising from overflowing middens and decomposing refuse in the courts were offensive in the extreme; and the filthy state of the cottages showed still more strikingly the great necessity for better drainage. I shall have occasion to show hereafter the effects produced by these evils on the health of the inhabitants. I may here state that it is impossible to furnish statistics of the amount of sewerage in this or any other town, where it is under the jurisdiction of surveyors of highways, for there being rarely, if ever, correct maps of the sewers, there exist no data on which to found an estimate. The house-drainage in Wigan is of course very defective, and must ever remain so until public sewerage is much improved. Public sewers in that town are not trapped, nor are they provided with any means of cleansing.

28. In Bury the surveyors of highways construct the sewers, and have the charge of sewerage. Under this system “there are,” to use the words of the surveyors themselves, “no regulations for under-drainage.” One sewer only has been formed in the town of late years, and that has been made by the Earl of Derby, to improve a damp neighbourhood, the property of his Lordship. This sewer is cylindrical, and measures about 1000 lineal yards. All the other sewers in Bury are square, and measure, as the surveyors state, “as near as we can tell, about 3300

lineal yards; but as we do not possess a plan, we cannot speak with certainty as to the length of the sewers."

With such small extent of sewerage, not amounting to two miles in length, and without plans or sections to facilitate connexion with private houses, it cannot be expected that drains from the latter can be either numerous or efficient, as shown in the following portion of evidence of the surveyors:—

"What facilities are afforded to the inhabitants for the connexion of private drains with main sewers, and under what regulations are they constructed?—In some parts a house-drain is readily connected with the under-drain, but in others there is not much facility for so doing. There are no regulations."

The public sewers are not trapped. "When there is an accumulation of deposit, the surveyors open the sewers and clean them."

From the above evidence it is obvious that the sewerage of Bury is utterly inefficient. Thus, in King-street, a large street inhabited by the working-classes, the sewer is about 18 inches only below the surface of the street, whilst the cellar dwellings are 8 feet below. The principal street of the town does not possess a sewer. The exit of the sewers is as bad as the sewerage itself. At Whitehead Bridge there is the mouth of a sewer, around which spreads a stagnant pool formed by its own refuse, and by the water of a filthy stream which comes from the upper part of the town. In rainy weather it is alleged that the water of this stream backs up the contents of the sewer into the houses adjacent. Following the course of the stream, a continuation of marsh is observed, and a feeble attempt to irrigate a small extent of land with the valuable refuse. This, however, is so badly performed that the nuisance arising from it more than counterbalances the good derived. The sewerage being in such wretched condition, it is not surprising that, according to the evidence of the surveyors,—“A considerable portion of the liquid refuse of the town drains into the subsoil, which is chiefly gravel, some runs into drains, and some remains stagnant, or is mixed with ashes.”

29. It has been considered unnecessary to allude to individual towns with respect to surface-drainage; for this, deficient in all, presents the same general characters. In Liverpool and Manchester the gutters now constructed are made of square-set stones, but in many of the poorer districts they still consist of boulder stones, which, of course, offer obstacles to the free flow and escape of surface-water. It will shortly be seen that scavenging rarely reaches the poorer districts in Liverpool, and other towns as often as once in the week, so that the refuse of houses, which, according to law, ought not to be, but which, according to practice, often is, thrown into the streets, obstructs the channels, and causes accumulations of decomposing refuse. This is most striking to any one accustomed to the carefully-formed gutters in the new city of Edinburgh. Greater attention than formerly is now paid in the larger towns of Liverpool, Manchester, and Preston, to the form of gutters, but not so in the smaller towns. In very few of the poorer districts of any of the towns in Lancashire is sufficient attention paid to this very necessary accessory to cleanliness, especially under the present system of scavenging.

I reduce to a tabular form the information relative to the construction



and expense of sewers and private drains in various towns. It must be observed, however, in considering this Table, that the excavation of the soil forms a very considerable item in the expense of constructing sewers, and that this is not exhibited in the Table.

TABLE showing a COMPARATIVE VIEW of the EXPENSE of the CONSTRUCTION of SEWERS, and their relative Size and Shape, in various Towns of Lancashire.

Towns.	Sewerage, under what Authority.	Mode of Reimbursing the Cost of Improvement.	Shape and Size of Main Sewers.		Average Cost per running Yard.	Shape, Size, and Cost, of House Drain.		Do Plans and Sections of the Sewerage exist?
			Shape.	Size.		Size and Shape.	Cost.	
Liverpool .	Local Commissioners	General Rate.	Egg . .	42 X 26 to 72 X 54.	Estimated at 33s. but, by actual expenditure, 60s. 15s.	18 X 9	11s. to 1l.	Very partially.
Manchester	Corporation	According to frontage.	Elliptical	18 X 35 to 72 X 38.		15 X 12	10s.	Ditto
Salford . .	Commissioners.	Ditto .	Circular Bottom.	44 X 22.	16s. 6d.	15 X 12	8s. 3d.	Ditto
Bolton, Great	Trustees .	Adopted when made.	Square, &c.	Unknown.	Unknown.	Unknown.	Unknown.	None
„ Little	Ditto . .	According to frontage.	Square .	36 X 36 to 18 X 18	7s. 6d.	Ditto .	Ditto .	Ditto
Preston .	Commissioners.	General Rate.	Circular.	30 X 30 to 48 X 48.	11s.	18 X 18	6s.	Ditto
Ashton .	Ditto . .	Ditto . .	Egg . .	26 X 24	6s. 6d.	14 X 12 Square.	1s. 6d.	Ditto

*Note.*—Wigan, Bury, and Rochdale, like Great Bolton, are in a state of deplorable ignorance with regard to this important trust. In them as in Great Bolton the sewers are square, and their junctions at right angles, instead of curvilinear.

30. Another point, in which there is great and universal deficiency with regard to sewerage, is the absence of proper surveys of towns including levels from a common datum. In Liverpool and in Manchester there are maps of the sewers and sections kept for reference; but no accurate and extensive survey; this want, however, will shortly be supplied in the larger towns by the Ordnance survey. Other towns are in a worse condition than those now mentioned. Thus, in Preston, I observed several recently made excavations in the streets, and on inquiring the cause I found that the Commissioners had been in search of the sewers. With reference to this point, the Rev. Mr. Clay states that “The information relative to the course, size, structure, and condition of the principal sewers was so vague and uncertain, that it became the employment of several weeks to open the streets, &c., in many different places, in order to ascertain these points.” It frequently happens that the only information as to localities and depth of sewers is possessed by only one person, long engaged in the service of commissioners or surveyors, with whose death all knowledge of the sewerage would cease. Sir Henry De la Beche found this to be the case in the large town of Bristol: and Lieutenant Kerlie, the officer of engineers engaged in surveying large towns in Lancashire, states that he has found the same circumstance in this county. In Wigan, Bury, Rochdale, and Great Bolton, little or no information could be furnished to me with regard to sewers, on account of the total absence of plans

or sections. This might be expected with surveyors of highways, on account of the uncertain tenure of their office. The evil effects arising from this absence of proper surveys are manifold.

Mr. Holme states that "Liverpool has suffered from the want of a correct public survey, comprehending a system of levels from some common datum, to which architects and builders might have free reference." And the nature of the evils is sufficiently shown by the manner in which, "in numberless instances, courts and alleys are formed without any declination for the discharge of surface-water;" and perhaps still more so, from the large amount of money expended in remedying the evils caused by the want of a proper plan, as shown in § 22.

In out-districts of large towns the want of public surveys is also severely felt. Mr. Langton states, with regard to Pendleton, that "Though building is proceeding steadily, it is entirely without regulation as to structural arrangements or drainage from any authority or agreement among the proprietors, each speculator acting independently and not on any general plan, for no public survey of the levels exists."

Mr. Holland, referring to Chorlton-upon-Medlock, remarks that "'To make a complete survey would very shortly prove an economical employment of the public money.'" Such surveys are stated by all competent witnesses to be much required.

#### SCAVENGING.

31. Scavenging is closely allied to sewerage, in so far as its principal object is to aid in the removal of refuse. When the sewerage of a town is complete, less scavenging is obviously requisite for the preservation of cleanliness; and where so incomplete as in the towns of Lancashire, it might be expected that more than ordinary attention would be paid to the preservation of cleanliness by efficient scavenging. The facts, however, are far otherwise.

32. Mr. Rose, the superintendent of scavengers in Manchester, states that "the number of streets, courts, and alleys cleansed and entered on the books is about 600, the superficial square yards in which are upwards of 770,000, and the number of streets, courts, and alleys cleansed, but not entered on the books, is 565, the number of superficial square yards in which is about 324,000." This register does not include streets and courts uncleansed. Mr. Rose also states that all streets (with the exception of those unpaved) are cleansed at least once every week. Now it has been found (First Rep., Vol. II. p. 393), that 1000 yards form the amount which can be effectually swept daily by one man. The number of scavengers employed in sweeping is equal to 60, and that of paupers to 18. On the supposition that the amount professedly swept was effectually gone over in a week, one man must sweep 2337 yards daily, or, in other words, do the work of two men. The whole surface, however, might be swept once in 14 days. It is particularly to be observed, that the only streets recognized by the authorities are those dedicated to the public. Unpaved and unsewered streets are not so dedicated, and, therefore, although from their bad condition calculated to retain filth of every description, they do not receive the benefits arising from the visits of the public scavenger. This is the case not only in Manchester itself, but also in the out-



townships. Mr. Holland, referring to Chorlton-upon-Medlock, states that "the unpaved streets and courts are not cleansed except sometimes by the inhabitants themselves. Many of them are dreadfully dirty." Courts and alleys are rarely swept in Manchester, being placed on the category of streets not dedicated to the public.

33. These remarks apply only to the state of Manchester when I first undertook its examination; but since then the whole system has been altered. Arrangements are now made by which the street-cleansing machine sweeps the streets twice as often as formerly, at a diminished cost of 500*l*. Much attention paid to the efficiency of this machine enables me to state with confidence, that the streets of Manchester are kept much more cleanly than under the old system of hand labour. The annual expense of cleansing in Manchester is shown in the following extract from the evidence of Mr. Nelson, chairman to the Scavenging Committee:—

"The annual expense of cleansing is about 4700*l*., the expense of watering is 600*l*., and the expense of collecting dust is 300*l*., making a total cost of about 5600*l*. per annum. The amount of money received last year for refuse was 800*l*. It has never exceeded that sum in any previous year."

34. The expense of scavenging in the town of Liverpool is 4820*l*., (a sum which probably does not include watering,) and the number of scavengers employed is on the average 65. It is stated, in the evidence given by the Scavenging Committee, that all the streets in the town (with the exception of a few private streets in the outskirts) are swept at least once every week. Now the total length of streets is stated to be 95 miles, which, on the assumption that none of them are wider than 24 feet, (the smallest size allowed by the Liverpool Building Act), would yield 1,337,600 superficial yards, an extent which could not be *effectively* swept by the 65 Liverpool scavengers, according to the above estimate of a man's work, more than once in three weeks. This may account for the very filthy condition of the streets inhabited by the poorer classes in Liverpool. Mr. Holme, whose evidence on the state of Liverpool has been so frequently cited, although intimately acquainted with the state of his native town, has not discovered that the streets are regularly swept every week by the public scavengers, as the following statement will show:—

"There are scavengers (generally paupers) employed in cleansing the surface of the streets. The parochial authorities contract with parties for the removal of mud, &c. for manure, but I am not aware that there are fixed gangs of men in certain districts, for I believe that when the superintendent reports upon a street, it is ordered to be cleansed. On this point, however, I do not speak with certainty; but, generally speaking, the streets are in a filthy condition in the lower and northern parts of the town, and are, at certain seasons, especially near the Docks, almost impassable."

It was my decided impression, from careful examination of streets in the poorer districts of Liverpool, at intervals of several weeks, that the regulation of the committee as to their cleansing was either not acted up to, or was very inefficiently executed; and in confirmation of the opinion formed from the appearance of the streets, I quote the following passage from the Report by Dr. Duncan, who, himself a native of Liverpool, and intimately acquainted with its localities, has drawn the same conclusion. He says—

"I ought to have mentioned, among the evils requiring remedy in Liverpool, the inefficient system of scavenging and cleansing in the streets inhabited by the poorer classes. The visits of the scavengers to these localities are, I fear, like angel's visits in more respects than one, none of these streets being visited oftener than once a-week, and much longer intervals frequently intervening."

35. The sum of 4000*l.* or 5000*l.* expended for scavenging in each of the towns now named may seem to be a large sum, and 60 or 70 scavengers may appear to be a large number; but let us compare Liverpool and Manchester, on these points, with the smaller and less opulent city of Edinburgh. Mr. Ramsay, the superintendent of scavenging (*First Rep.*, Vol. II. p. 391), states,—

"All the streets in the town are cleansed; in fact, I may say the whole town is cleansed every day. The narrow confined closes or wynds are cleansed several times in each day. The total expense of the cleaning department is nearly 12,000*l.*; but the sale of manure decreases, to a great extent, this expense. On the average of several years the sale of manure has yielded 10,000*l.* per annum. The number of scavengers vary from 100 to 130, according to the season of the year. The wages which they receive are 12*s.* per week. The number of carts employed is about 50 per day."

These carts go round every morning through the whole bounds; and in the old town and poorer district again at half-past nine in the evening; and on Saturday night over the whole bounds. In Liverpool and Manchester, only about 24 carts are employed, and there are no regulations of the kind alluded to in the case of Edinburgh.

The points which peculiarly characterise the Edinburgh practice are the acknowledgment of the principle that each portion of the town requires sweeping once every day, and the courts and alleys inhabited by the poor more frequent cleansing than the richer districts. In Lancashire, the courts and blind alleys are not supposed to come under the province of the public scavenger, and are, therefore, left uncleansed. We are also struck with the great amount received for manure in Edinburgh, compared with the sums received for it in Manchester and Liverpool. In the former city, the refuse obtained by frequent cleansing, and the night soil, which is vested as police property, yield, as shown above, a sum which comes within 2000*l.* of the expense of cleansing. In Liverpool, the price obtained for manure is 1150*l.*, and in Manchester only 800*l.*; but in these towns the night soil is not considered public property.

36. The following table will exhibit, in a reduced form, the returns made by superintendents of scavenging in various towns:—



TABLE showing the ARRANGEMENTS for SCAVENGING in various Towns of Lancashire.

Towns.	Scavenging under what Authority.	Number of Scavengers Employed.	Stated Periods for Scavenging dedicated Streets.	Cost of Scavenging.	Amount obtained by Sale of Manure.	Are Courts and Alleys cleansed?	Are undedicated Streets cleansed?	Number of Places of Deposit.
Liverpool .	Committee of Town Council.	65	Once a-week.	£. 4,820	£. s. 1,150 0	No	Seldom	1
Manchester.	Ditto . . .	78; now swept by machine.	Once a-week.	5,600	800 0	No	Seldom	7
Salford . .	Commissioners	28; chiefly paupers.	Once a-week.	No return.	88 0	No	No	1
Chorlton-on-Medlock.	Ditto . . .	Swept by machine.	38 times a-year.	650	..	No	No	1
Rochdale .	Police Commissioners.	9	Once a-week.	207	18 10	No	No	2
Preston . .	Police . . .	9	Once a-week.	531	271 0	No	No	1
Ashton . .	Police Commissioners.	Paupers . .	No regulations.	170	17 0	No	No	1
Bolton . .	Trustees . .	Ditto . . .	Ditto . .	Unknown.	Uncertain.	No	No	2
Bury . .	Surveyors . .	No regular service.	Ditto . .	Ditto .	Ditto .	No	No	None
Wigan . .	Ditto . . .	Ditto . .	Ditto . .	Ditto .	Ditto .	No	No	1

37. The above table exhibits the general state of scavenging, and illustrates the chief evil connected with the present system, viz., of considering that courts, alleys, and undedicated streets do not come within the province of the public scavenger. These are the very localities in which filth most abounds, and in which the difficulty of removing refuse is most felt; consequently such places are the constant seats of disease, as I shall show in the second part of the Report.

38. In those towns in which scavenging is placed under the authority of the Surveyors of Highways, the paviors and other men employed by the Board also work as scavengers, when they are not engaged in other labour; but as this renders scavenging quite uncertain, the cleansing of towns, such as Wigan and Bury, is much neglected. In other towns the streets, except the leading public thoroughfares, are never cleansed more than once in the week, a provision, as it will be seen, wholly inadequate for the purposes of cleansing. We have already seen that in the city of Edinburgh, where there is little traffic, and therefore less necessity for cleansing, the streets are invariably swept once every day. This is also the case in many other towns in Scotland.

As scavenging is a most important subject in the consideration of the sanatory provision of a town, I subjoin in a tabular form returns made to me by the authorities of various towns in Scotland, for the purpose of showing by comparison the low state of that department of police in Lancashire. The "cleansing department" of police in Edinburgh possesses additional duties besides those of scavenging, as shown in Mr. Ramsay's evidence. If the few hundred pounds expended in those other duties be deducted from the expense of scavenging, the latter will approximate more nearly to the amount obtained by the sale of manure. In several of the towns, it will be observed, that the scavenging is carried on at an actual profit, or at all events without any expense to the public, the contractors agreeing to scavenge every part of the town each day merely for the sake of obtaining the manure.

# 368 *Deficient Scavenging in Lancashire compared with Scotland.*

TABLE showing the ARRANGEMENTS for SCAVENGING in various Towns in Scotland.

Towns.	Scavenging, under what Authority.	Number of Sca- vengers em- ployed.	Stated Periods for Scavenging dedicated Streets.	Annual Cost.	Amount obtained by sale of Manure.	Are Courts and Alleys cleansed.	Are un- dedica- ted Streets cleansed.	Number of Places of Deposit.	Number of Carts em- ployed.
Edinburgh.	Police Act . . .	115	Every day . . .	£. 12,000	£. 10,000	Yes .	Yes .	2	55
Glasgow .	Commissioners	64	Principal streets once a-day; other streets from five times to once per week.	2,759	1,100	Yes, ge- nerally.	Yes .	6	10
Aberdeen .	Local Act . . .	51	Every day . . .	1,400	2,000	Yes .	Yes .	2	16
Perth . . .	Police Act . . .	35	Ditto . . .	1,300	1,730	Yes .	Yes .	1	5
Haddington	Magistrates . .	3	Ditto . . .	Nothing	130	Yes .	Yes .	1	2

These returns, which have been confirmed by inquiries in other towns in Scotland, show that scavenging, when conducted properly and extensively, may be carried daily to every part of a town, without any ultimate expense, or perhaps even with direct profit. The frequency of scavenging is found materially to diminish the expenses incident upon it, as has been shown in the examination of Mr. Whitworth, whose important evidence prevents the necessity of enlarging on this subject. In the preservation of streets and roads, frequent scavenging proves a positive and direct economy of public money, and in the prevention of disease, an indirect, though no less certain, saving of public burdens.

## CESSPOOLS AND NECESSARIES.

39. The infrequency of scavenging, and the neglected state of the courts and alleys, has given rise in Lancashire to a practice unknown in the Metropolis, viz., the forming of open cesspools, dunghills, or "middens," as they are termed, as places of deposit for refuse from all the houses in the court. There is scarcely a court in any of the towns without a large open cesspool, into which all night soil, ashes, and other refuse, are thrown.

These open cesspools are also very generally attached to the back yards of dwelling-houses, and are not confined exclusively to those inhabited by the working classes. They do not come under the cognizance of the authorities any further than that a regulation usually exists to prevent the removal of their contents during the day—a regulation which in many of the towns it is impossible to enforce, and the consequence of which is, that there are no systematic arrangements for their removal. This circumstance has called into existence in the large towns a wretched set of men, similar in habits and appearance to the chiffoniers of Paris. Mr. Moore, the vice-president to the Agricultural Society of Manchester, has examined into the habits of these men. "The nightmen," says Mr. Moore, "are very filthy in their appearance and habits, and, being often assisted in their labours by their families, their houses are usually most offensive and wretched abodes." Nightmen are paid 3s. for a load of two tons, and to obtain this quantity, two men, with some assistance from their families or from the carters, may be able to load two carts from 3 A.M. to 9 A.M.: they, therefore, generally frequent those places where most manure is to be



procured with the least labour, neglecting to visit districts in which this is not the case. But the inhabitants of districts frequently visited by these reckless men complain of them as an intolerable nuisance. Mr. Rishton, the town surveyor of Liverpool, states that he "considers himself called upon particularly to remark, that many of the privies are damaged and rendered useless by the nightmen wilfully breaking up the floors and seats to get out the soil; they will pull down one side of the bog-hole that their work may be done with more ease. In this way they cause considerable damage to property, and it is too often left in the same state for a considerable time, and the place becomes one open mass of filth from daily accumulation." Mr. John Wood, another surveyor, remarks that "the dilapidation of the privies is caused in a great measure by the recklessness of the nightmen, who, finding the ash-holes small and confined, will sometimes break down the seats or doors. There being no check upon them, they take away only such of the soil that suits them, and leave the rest scattered about the court, where it is allowed to remain." Dr. Duncan states that "in many instances the inhabitants of front houses and cellars make use of the conveniences in the courts, so that the ash-pits generally become full to overflowing long before the nightmen make their appearance to empty them. The consequence is, that the filth, which would otherwise find its way into these receptacles, is deposited in the corners of the court, in the entries or back passages adjoining it, or in the street itself." The Health Act for Liverpool contains a clause to compel occupiers of houses to cleanse out cesspools at 14 days' notice. But as many of these occupiers are only weekly tenants, and as the expense of cleansing an ash-pit and privy is considerable, they rather remove from the dwelling than bear the expense; so that the clause is quite inoperative.

40. Under this system there are, of course, no general or systematic regulations for cleansing open cesspools. I have in many places found middens full of refuse of the most filthy description, which had been left uncleansed for months. In those districts in which a greater harvest of night-soil tempts the frequent visits of nightmen, the nuisance is often as great, as Mr. Holland points out in his Report:—

"About two-thirds of the houses in this township have separate necessities, with middens, which do not generally empty into the public drains, the contents being carried away from time to time in carts; this practice causes in many parts a most serious nuisance. The number of necessities in a back street is sometimes so great, that one or other constantly requires emptying, and the back street is scarcely ever clean. Very often the filth is laid in the front street (even in neglect of the Police Act, clause 125), not afterwards properly cleansed away, and the smell remains till the next heavy rain removes it."

This will be understood more fully when I come to the consideration of the structure of dwellings. I can fully confirm Mr. Holland's statements from my own observation, not in Chorlton alone, but in many other towns. The poor find an excuse for want of cleanliness in the reckless conduct of nightmen; for, on remonstrating with them on the blocked-up channels before their houses, and the generally filthy appearance of the court, I have often been met with the remark, that to

keep them otherwise was impossible, subject as they were to the visitation of these nightly prowlers. The inhabitants, having a dread of such visitations, often positively refuse to have the middens emptied until the nuisance becomes intolerable. John Andrews, a night-collector in Ashton-under-Lyne, states that "the necessities are only cleaned, on the average, once in every three or four months, and that many families positively refuse to have them cleaned oftener."

These general features respecting night-soil and its removal are characteristic of every large town in Lancashire, so that it has been thought unnecessary to describe each in detail. I shall again have occasion to refer to this deplorable and, unfortunately, all but universal custom of permitting open cesspools in crowded districts. It has been shown, both by inquiries in rural and in town districts, that the presence of decomposing refuse is productive of great disease. It can scarcely, therefore, be expected that other than the most serious effects must follow from this filthy practice. These, however, it is not at present my province to consider.

41. Few houses, except those belonging to the higher classes of society, are supplied with water-closets, the tenements for the labouring classes having necessities attached, generally in communication with the open cesspools or "middens" already alluded to. The great value of land in manufacturing towns has occasioned the erection of many buildings without necessities attached, or even receptacles in which to deposit refuse. Hence it is very frequent to find large courts with only one necessary common to all the inhabitants residing in them, and, very frequently, to those of houses in the street adjacent. Thus it is stated by Mr. Neal, superintendent of nuisance inspectors in Manchester, "that in many densely populated parts of the town the inhabitants (who are chiefly of the poorest class) are subjected to great inconvenience for want of necessities. From a report made by the superintendent in January last, it appeared that there were 645 houses in the neighbourhood of Oldham-road and St. George's-road, with families of 11 persons on an average, making an aggregate of 7095 persons, having only 33 petties (necessaries) for their convenience, which, as might be supposed, are generally in a most disgusting and filthy state." The Rev. Mr. Parkinson and Mr. Langton, in an examination into the habits of the poor in three districts of Manchester, selected as affording examples of well and ill conditioned localities, found a great deficiency in the number of privies. In a district of Newtown and Irktown they state "that there are very few privies throughout the neighbourhood, three or four streets having no accommodation of that kind whatever." Out of 80 cases examined in this district, which is chiefly inhabited by Irish, 57 were without access to privies; the remainder, with the exception of 7 cases, had access to privies, each of which served from 6 to 12 families. In a locality in Gartside, out of 80 cases they found 8 without privies, 24 with one privy each, and the remainder with access to privies serving from two to eight families. This district is chiefly inhabited by English residents, but is not of recent erection. The third district in the township of Hulme, being of modern erection and in an open airy situation, is much better circumstanced in this respect. Out of 80 cases reported, 64 had one privy for each family, 14 had access to privies serving two



families each, and 2 were not ascertained.\* A similar inquiry instituted into a badly conditioned district of Salford gave similar results, as stated by Mr. Broomhill and Mr. Irving. With reference to privies, they say—

“There is a deplorable want in these conveniences; many visited by us being so dilapidated as to be utterly unfit for the purposes intended, and in such a disgraceful state that many persons never go to the ones nearest their own dwellings; in most cases they are situated in the cellar under a particular house, and, being rarely emptied, emit such offensive smells that the house immediately above them is often let at 50 per cent. less than the property contiguous. Out of the 41 houses reported, only 2 have privies attached to them; only three can we report as decent; the others highly indecent and filthy; the distance varies from 5 to 50 yards, some serving for the accommodation of 9, 12, 18, 20, and even 30 families.”

In the more recently erected parts of what is popularly termed Manchester, necessities are more frequent, though not attached to each house. Mr. Holland states that “about two-thirds of the houses in Chorlton have separate necessities, with middens or cesspools attached.”

In Liverpool the want of privies is very great. It is stated by the Health Committee of the Town Council that “a large proportion of the courts are wretchedly off in this respect; some have no privies at all;” and Mr. Holme mentions that “the privies of houses built in courts are in almost every case improperly situated, and are utterly inefficient for the purposes of convenience, much less of decency. Generally, a court containing 16 houses will have two single privies for the accommodation of a population averaging 80 persons.”

By an investigation instituted at the order of the Scavengers’ Committee, it was ascertained that in 26 streets examined, containing 1200 front houses, there were no less than 804, or two-thirds, entirely destitute of yard, privy, or ash-pit.

In other towns in Lancashire the same want prevails. Thus, in Preston, an enumeration from house to house showed the state of certain districts with regard to privies to be as follows:—

Canal-street,	containing 33 houses and 175 persons, had 4 privies.		
Back Canal-street, (1)	19	108	4
Back Canal-street, (2)	11	66	2
Pottery-hill,	3	24	0
Hope-street,	34	188	7
Savage’s-court,	12	45	1
Court in Hope-street,	3	20	1
Back Hope-street,	4	19	2
Willow-street,	20	128	12
York-street,	10	51	9
Holden’s-square,	21	137	2
Holden’s-yard,	9	55	2
Total . . .	179	1016	46

Springfield-place, Edmund-street, Buckingham-street, Clarence-street, Poplar-street, Rhodes’-square, School-street, and River-street,

\* In the course of an investigation instituted in Manchester by a Special Board of Health, during the prevalence of cholera, it was found that of 6951 houses inspected, 2221 (about one-third) were without privies.

in all containing 142 houses and 814 persons, were found to contain 116 privies in good order ; a creditable contrast to the above.

In Bolton a similar enumeration was made by the agent to the Provident Society, under the direction of the Rev. Mr. Birley, the aggregate result of which showed that, to 909 houses and 314 cellars examined, there were 210 privies, or an average of one privy to from 26 to 30 persons. Mr. Coulthart alludes to a locality in Ashton, in which there are only "two necessaries for about 40 families ; and these two in such a disgusting state of filthiness that it is impossible for any one not accustomed to the effluvia to enter the passage leading up to them." In other towns in Lancashire similar evils prevail, although these have not been statistically elicited.

Cellar dwellings are of course wholly unprovided with necessaries, so that their population, nearly 18,000 in Manchester, and certainly not less in Liverpool, are destitute of means of removing night-soil from their habitations. The result of this is, as Mr. Rishton remarks, "that the occupiers of cellars, having no convenience common to their dwellings, also resort to the necessaries in courts, emptying out their filth and dirt in the passage up to the court, and causing a most disgusting and foul nuisance to the neighbourhood generally."

42. But the mere want of necessaries is not the only evil to be regretted. Those which exist are very generally filthy in the extreme, as there are no regulations for a systematic cleansing of privies, unless private agreements made by the neighbours that each shall clean them in rotation be entitled to such a name. The privies, frequently without doors, and common to both sexes, must outrage modesty, if they do not lead to licentiousness. It is not uncommon to find necessaries built without doors ; the excuse given for this deficiency being that if these were attached, they would be broken up for fire-wood—a circumstance which may occasionally happen in very bad neighbourhoods, although the fear is much magnified.\* The bad situation of necessaries is also a serious evil. I have in many instances found the ordure permeating through the walls to the houses adjacent, as described by Mr. Holland :—

"I have known instances where the wall of a dwelling-house has been constantly wet with fœtid fluid, which has filtered through from a midden, and poisoned the air with its intolerable stench ; and the family was never free from sickness during the six months they endured the nuisance. Instances in which fœtid air finds its way into the next dwelling-house are not unfrequent. I know an instance (and I believe there are many such), where it is impossible to keep food without its being tainted for even a single night in the cupboards on the side of the house next the public necessary, and where the fœtor is offensively perceptible always, and oppressive in the morning before the door is opened. In this instance the woman of the house told me she had never been well since she came to it, and the only reason she gave for her living in it was, the house was 6*d.* a-week cheaper than others free from the nuisance. It is evident that these evils would be very considerably diminished by lining the walls of all the necessaries, which are not separated from houses, with flags and cement, so as to make them impervious either to air or liquid, while a flue should be erected to convey the

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\* In the group of cottages figured in Mr. Clay's Report on Preston, I found all the doors taken off the necessaries and used as kitchen tables, the former fronting and being exposed to the window of the kitchen.



foetid gas above the roofs of the houses, and not leave it to be diffused among the air which the inhabitants must breathe. But to remedy the evil effectually, water-closets should be substituted for necessities, and no accumulation of excrement allowed."

The surveyor of the south district of Liverpool refers to this circumstance—

"In looking through the courts, the surveyor has seen many cases, where the bogholes, connected with the property of one landlord, are placed directly against the walls of houses belonging to another proprietor, and occasion considerable injury from the improper construction before alluded to. If the owner refuses to do what is necessary (which it is much to be feared is too often the case), and what in justice he ought to do, the injured party has no redress but by an action at law; the great expense deters him from seeking redress by that means, the evil still remains, and the tenants are the sufferers by inhaling the noxious vapours of an impure atmosphere circulating through their dwellings, and carrying disease and sickness into the bosom of their families."

Mr. Holme and other witnesses allude to the same evils. Water-closets exist only in the houses of the higher classes; for the economy of removing impurities by means of water does not seem to have been perceived, either by the public authorities or by water companies, neither of which bodies have offered the proper facilities for the application of this principle; the advantages of it will be adverted to in the proper place.

#### NUISANCES.

43. Persons accustomed to witness filth in a form so disagreeable cannot be expected to retain habits of cleanliness, or where they have never existed, to acquire them. The difficulties of effectually prosecuting the law for the abatement of nuisances prevents the repression of even more glaring instances of them than those above alluded to. The slaughter-houses in courts are not interfered with by the inspectors of public nuisances, for the following reasons, assigned by Mr. Neal, the Superintendent Inspector for Manchester:—

"There are no powers in the Police Acts for the removal of slaughter-houses, and the mode of proceeding would be by indictment at the Quarter Sessions as public nuisances, before which Court any such indictment would have to be supported by the evidence of the public passing and repassing along the highway or public road where such slaughter-house is situated. This course would be attended with considerable expense, and it has been the custom generally to present this class of nuisances at the Court Leet, which is held twice a-year.\* Before this Court it has been found difficult to support the presentment, in consequence of the inhabitants who have complained not attending to give evidence. This will be seen by the fact that at the Court Leet held in October, 1840, fourteen cases of public nuisances were dismissed for want of evidence; and in a case of public nuisance, presented at the Court Leet, held in September, 1842, the Chairman made strict inquiry as to whether or not the smell was perceivable on the public highway, as (he said) that Court had only power to interfere in such cases as were proved to be annoyances to the public generally, and that, except where existing in or adjoining to public thoroughfares, the nuisances must be remedied by action on the part of the parties aggrieved."

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\* For information as to the suppression of nuisances by a Court Leet, see Mr. Coulthart's Report, App. First Report, p. 71, *et seq.*

Hence, if these slaughter-houses be in private courts, they are permitted to remain, however injurious to the inhabitants, and in whatever state of filth they may be kept. Thus in the township of Manchester alone there are 77 slaughter-houses, (in many instances six or eight butchers killing at the same place,) but all of these are without regulations. In Bolton, for example, I found several courts in which the middens attached to slaughter-houses were filled with the offal of the slaughtered animals, and had not been cleansed for, at least, two months. In other towns I have found slaughter-houses below dwelling-houses, the smell in which was most insufferable, and in many of these dwellings the inhabitants looked pale and sickly, and diarrhœa frequently prevailed although absent from the courts contiguous. Yet the state of the law prevents any interference with the manner in which slaughter-houses are conducted. True it is, that aggrieved parties may indict the occupiers of the premises, but, being of the poorer class, they can neither afford the time nor the money to pursue such indictment; nor, indeed, are they aware of the pernicious effects arising from the presence of decomposing refuse. The uncertainty of the result of an indictment, moreover, is alone sufficient to deter even those who have both the means and the inclination to suppress these nuisances. The following statement, given during the inquiry into the state of Bristol, to Sir H. De la Beche and myself, by a respectable shopkeeper, whose sleeping apartments and sitting-rooms look over a court, in which a slaughter-house for pigs is situated, will illustrate at the same time the evils and the ignorance of the bad effects produced.

“Have you resided for some time in this house?—Yes, for several years.

“What occupation does your neighbour pursue?—He kills pigs, which he gets over from Ireland. Often the pigs, in coming over in the packet, die, and I have seen as many as 30 dead pigs at a time brought into the yard. They are thrown under that shed there, until there is time to cut them up, and by that time, I have seen the maggots fairly dropping out of them. Then they are cut up, and I believe are made into salt bacon or sold for sausages. The entrails of such pigs are generally too far gone to be of use, and they are thrown into the dunghill. When the dunghill is stirred up to be taken away, oh! sir, the smell is awful; we are forced to shut our windows and doors, and stuff pieces of cloth into the key-holes; but all this does not keep it out. The entrails of the live pigs killed in the yard are boiled and sold, and give out a very bad smell, but nothing like the others.

“Have you not complained of this nuisance?—Yes, we have, but we were told it was no use complaining, for doctors agreed that these smells were very healthy. Besides, the owner of the yard is a very good neighbour, and tries to keep things as clean as he can, but his occupation beats him in that.

“Is that your only child?—Yes, but it is a poor sickly thing for 15 months old. I thought at one time these smells might have something to do with its being so poorly, but that can’t be if they are healthy.

“Is your wife in good health?—She is troubled with bad headaches constantly, but she used to have them before she came to me.”

Similar injury to property and to health frequently arises from the escape of putrid emanations of sewers; the aggrieved parties have no summary means of obtaining redress, except in those towns which have local Acts containing clauses for the removal of nuisances of this kind.



The following statement of Mr. Brown, a collector of cottage rents in Preston, affords an illustration of the evil alluded to.

“ I collect the rents from the cottages in Queen-street Court, about 10 houses. There is a grating connected with a sewer which runs under the court at a right angle to the front of the houses. The smell of gas water is very bad; and occasionally, when they ‘let off’ at the gas-works (at Horrocks’s) the smell is unbearable. There were two persons in *fever* in the court, and Mr. Haldane, the medical man, said, if they did not leave, it would kill them in time. The gold thread used by the weavers becomes black; and the silver paid to me for rent is frequently a copper colour. I never receive silver so coloured from any other cottages.”

Pigsties, an intolerable nuisance in crowded towns, come under this class of nuisance, as shown in the examination of Mr. Neal.

“ In a district named Little Ireland, there are many pigsties in a very offensive state. In a court at the back of No. 1, Nicholas-street, there are pigs kept, and an open gutter runs through that and the adjoining court, until it meets a covered sough; the smell in these courts is occasionally insufferably disgusting (and many similar instances might be mentioned). Have the inspectors power to report on such nuisances? are they ignorant of their existence? or are the powers existing insufficient to remedy the evils?—We are fully cognizant of the existence of the nuisance arising from pigsties in Little Ireland and other places; but the powers at present possessed are insufficient to remedy the evils, except by indicting the parties at the Quarter Sessions, or presenting them at the court leet.”

The nuisance arising from privies without doors, and in a filthy state, overflowing middens and the like, cannot be removed without the tedious result of a legal process: Mr. Neal’s examination thus proceeds:—

“ The dunghills (middens) in many courts are in an extremely filthy state; are they often reported upon as nuisances, to whom are they reported, and how are the evils remedied? Does a regular and systematic inspection of such courts form part of the duty of the inspectors, or do they allow the nuisances to be reported by the inhabitants themselves?—There are no powers in the local Acts for compelling the removal of middens in courts or other confined passages; vacant lands, and places which are considered as private property, the owners thereof are liable to be indicted by the parties aggrieved.

“ In many courts (Lock-gates, Connaught-courts, &c. may be specified) the privies are in a disgusting state of filth, and are frequently without doors. In Chorlton there are similar instances. Near Old Garrat Road there are two privies, one below the other, half way up, and on the outside of a factory wall, so that the ordure falls into the river beneath, in the sight of the neighbouring streets. Do such instances, so detrimental to the morals, habits of cleanliness, and comfort of the inhabitants, not come under the cognizance of the inspector of nuisances?—Privies left without doors come under the head of public nuisances, for the suppression of which there is no summary power.”

Nuisances even of a more serious kind exist; the following is from the evidence of the Inspector of Nuisances for Rochdale:—

“ There is a pond in Barrack-field in an offensive state; the open drain or gutter running before the house is also very offensive; have you ever thought it your duty to report upon them?—Barrack-field is an open space of land, on which there is a number of houses and streets formed, but they are neither paved, soughed, or drained. I have often pointed out these

things to the owner of the property, as well as made a report to the Commissioners of Police; but nothing has been done to remove the cause of the complaint, the Commissioners not having power by their Act to compel these things to be done."

The ditch and stagnant pool above referred to are most injurious to the health of the inmates of the houses. Mr. Spencer, the registrar of deaths, states—that the mortality is excessive in this locality, and that epidemics are frequent. The inhabitants were extremely desirous to have the nuisance removed, and improvements made, but their wishes and efforts are vain. A woman residing in one of the cottages stated, "I and my neighbours agree to clear the ditch in turns, but we cannot venture to do it more than once in the week, it makes us so deadly sick." These evils, serious in their effects, would of course be much mitigated by an efficient system of drainage. A nuisance of common occurrence—for the prevention of which there is no summary power—is alluded to by many witnesses, and is thus described by Mr. Laxton, an architect and civil engineer in Liverpool:—

"In the neighbourhood of the town large plots of building-ground exist, where water and refuse are allowed to accumulate and become stagnant, and cause noxious vapours to arise, and thus counteract the otherwise beneficial result which open spaces might produce, when left for ventilation. These grounds are indeed public nuisances, for, not being enclosed, every one seems to think he may do as he likes with them, and, therefore, without scruple, discharges therein any rubbish or refuse he may be desirous of disposing of, and so diversifies the surface and contents as to produce a most imposing treat for the optical or olfactory organs."

Another class of nuisances, for which there is partial remedy in the Health Act for Liverpool, but for the removal of which summary powers are highly necessary, is the filthy state of the interior of houses. Asses, hens, and pigs, are not unfrequently kept in dwellings, and I have seen them even in the sitting-rooms of the poor. Fever is induced by the filthy state of the interior of the house, and being communicated to other persons in the vicinity, becomes an extensive source of general disease and misery. One house is depopulated by fever, or the head of the family being cut off, the remainder remove: new tenants enter the infected house; they also becoming victims, make way for more, and thus fever becomes extended and perpetuated, because the authorities do not possess the powers contained in the Metropolitan and Liverpool Acts—powers, however, not sufficiently summary, for cleansing the interiors of private houses. Mr. Ramsay, who has paid much attention to the evils arising from this cause, makes the following striking statement as an example of these evils:—

"On the fourth or fifth floor of a house within a short distance of where I now am, for example, the whole occupants of that floor, consisting of several dwellings, were attacked during the last severe visitation of fever in 1838, and the whole floor repeatedly cleared by the inhabitants being sent to the infirmary. A fresh set of tenants were no sooner inducted than the disease again broke out, and again the floor was tenantless. It was occupied and re-occupied several times with similar results, till at last there was difficulty in finding occupants on any terms. The proprietor lived in the country, and, beyond getting his rents, took little interest in the matter; but on being urged to get the whole floor thoroughly lime-washed, he did so, and fever, till within the last month, has not been known in it since."



Mr. Ramsay considers that it would be a wise expenditure of public money to lime-wash every year all the houses under 4*l.* rental which might require it: the number he estimates at three-fifths, and the utmost expense for the whole tenement at 7*d.* The Rev. Mr. Birley, of Bolton, informs me that the average expense, deduced from the experience of the Provident Society in furnishing materials for limewashing 559 houses, amounted to 5½*d.* per dwelling. The examination of houses in Manchester by Dr. Kay, although made many years since, will be seen by this collateral evidence to be applicable to the present day. It is most desirable, in giving powers to qualified officers to direct the cleansing of such houses as they think may require purification, that as few legal difficulties as possible should be put in the way of their execution. The powers in the Metropolitan and Liverpool Acts are not sufficiently summary, and, consequently, are nearly inoperative.

The nuisances now alluded to are of such a nature as might be safely dealt with in a summary manner, but others affecting public health, such as obstructions to natural drainage, and injurious manufactures, involve private interests to such an extent that hasty interference or summary power might be objectionable. Private interests, however, too often place obstacles in the way of public improvement: the following instance may be cited as an example. Opposite to the Manchester Royal Infirmary, and within the grounds attached to it, is situated a deep excavation, now filled with water. Formerly erysipelas, in an aggravated form, nearly allied to hospital gangrene, prevailed to a great extent amongst the patients in the infirmary. This excited the attention of the medical officers of that institution, who instituted an inquiry into the cause, and after mature deliberation, recommended that the stagnant pond alluded to should be kept constantly filled with water to be renewed at stated periods. Since the introduction of this plan, and that of dry-rubbing the floors of the building, the erysipelas has much abated, but has not yet disappeared. The pond could easily be drained and filled up; but in this case the lord of the manor and another party might claim the ground, and, by building on it, encroach on the proper space round the infirmary.

The smoke nuisance might be cited as an instance of the opposition of individual interest to public benefit; and here it is to be remarked that they who occasion the nuisance do so in ignorance of the benefits to be derived to themselves from a consumption of smoke. It has been clearly demonstrated by every well-conducted experiment on smoke-burning, that there is a saving of fuel varying from 5 to 20 per cent., and in some cases even more. The principal objection to a compulsory enactment on this subject—"small boiler-room"—is erroneous and unscientific; and the still more frequently repeated objection to its introduction, that great attention is required on the part of firemen, can have no weight with the public, who are exposed to enormous pecuniary burdens, and without doubt also, as shown by the evidence of Mr. Leigh, to much disease, by the continuance of the nuisance.\* But even

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\* The pecuniary annual loss to the community in Manchester for the excess of washing rendered necessary by its smoke is above 60,000*l.*; for it has been found that 1*d.* weekly per head of the population forms a very low estimate of the increased expense when contrasted with the average expense of washing in towns free from

could the latter objection be for a moment entertained, its removal would be made easy by the introduction of some such system as that in operation on certain lines of railways, viz., making the firemen responsible to their employers for the consumption of smoke, and by putting them upon "piece-work," as far as regards the coal itself, so as to afford an inducement for its regulated and economical consumption.

#### STREETS AND SITES OF HOUSES.

44. Most of the large towns in Lancashire have rapidly increased within the last 20 years, and the value of land for manufacturing purposes has offered many inducements to the builder to construct streets and houses so as to obtain the greatest return for the land used in their formation. Hence narrow streets, blind alleys, and courts, are of frequent occurrence in all large towns in this county, although they do not differ in any marked degree from similar localities in other towns of England; but they are more numerous. Great improvements in this respect, however, have been effected in some of the Lancashire towns within the last 10 years.

These evils have been experienced to a great extent in Liverpool. Mr. Holme states, with reference to that town—

"That the soil is subdivided into a multitude of holdings; and a man runs a new street, generally as narrow as he possibly can, through a field, not only to save the greater expense of soughing and paving, which, in the first instance, falls upon himself, but also that he may have a greater quantity of land to dispose of. The next owner continues that street, if it suits him, but he is not obliged to do so; and the consequence is, the growth of narrow thoroughfares, the erection of mean edifices; the utter neglect of proper sewerage, the inattention to ventilation, and that train of evils which is so much to be deplored is the natural consequence."

The melancholy facts elicited by the examination of the town surveyors of Liverpool show that in the 12 parochial wards of that town (that is, exclusive of the four extra-parochial wards), there are no less than 55,534 persons living in courts, some of which are of the most objectionable construction. Out of 1982 courts examined by the surveyors, only 478, or less than one-fourth, were found to be open in the front and back, so as to admit a current of air through them. Many courts and narrow streets were run up in Liverpool previous to the operation of the Health Act, with the express intention of escaping its salutary clauses; and even since this Act has been brought into operation, means have been found to evade its intentions, as shown by Mr. Aspinall, who states that, to elude the clauses enacting a width of 15 feet for courts, this width is kept merely at the entrance, the rows of houses then going up in wedge shape, and branching off like a tree, so that what is nominally a court, becomes a prolonged street, there being no regulation as to its depth. The spirit of the Act is further evaded by running up houses of a disproportionate height to the width of the courts. The evil is still further increased by a most objectionable power given by the Act of reducing the width of the entrance by the

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smoke. By introducing into the calculation the excessive expense of renewed painting and whitewashing, it appears, by very low estimates, that the annual money loss to Manchester by its smoke is double the amount of its poor-rates.



erection of ash-pits and privies ; so that the air, entering by its only inlet, has to pass over these, and take up putrid emanations before it reaches the court itself. Fortunately the Health Committee perceive the great evil of this power, and have, as much as possible, prevented it being carried into effect. The courts in Liverpool and in other towns are, of course, very inefficiently ventilated, and, from their open cesspools, possess an atmosphere far from salubrious. The houses on each side of a court are frequently built back to back, so that the court, already insufficiently ventilated, is made up of houses still worse in this respect ; for few will be inclined to subscribe to the opinion of the Health Committee of the Town Council that this form does not prevent sufficient ventilation, "as each room has three openings, viz., a door, a window, and a chimney." This might be sufficient when the houses exist in ventilated situations ; but with nothing but the already vitiated atmosphere of a court containing open cesspools to aid in the ventilation, back-to-back houses cannot be considered dwellings of proper construction.

In Manchester no statistical enumeration of the number of courts has been made, so far as I am aware. Certainly they are less numerous than in Liverpool ; but in their construction not much superior to those in the latter town, for the same want of ventilation, and the same sources of poisonous matter in the open cesspools or ash-pits, characterise both towns. But there are many streets in Manchester, Salford, and their out-townships, which, although called streets, are, in fact, mere courts, being of small dimensions, and closed at one end. Neither in Liverpool nor in Manchester is there power in their local Acts to prevent streets being closed up at the ends. In the township of Chorlton, adjoining Manchester, one-eighth of the inhabitants live in streets of this description. These streets, not being thoroughfares, are considered as undedicated property, and on this account are not cleansed by the public scavenger. They are, therefore, generally excessively filthy, and, as I shall have occasion to show in the second part of the report, possess a mortality considerably greater than the open streets of the same class immediately adjoining. In Manchester the local Act (11 Geo. IV. c. 47, s. 39) states that no street, way, lane, court, or square, shall be less than 24 feet in width ; but as this clause has only been brought into operation since 1830, all the streets built before that time were subject to no such regulation. It will be observed that this minimum width, the same as that for streets at Liverpool, is in reality very small when compared with other towns. In Birmingham the minimum width is fixed at 42 feet.

In other large towns in Lancashire the evils of narrow streets and courts exist, but not to such an extent as in Liverpool and Manchester. The Rev. Mr. Clay states, with regard to Preston, that "in the better parts of the town the streets are sufficiently wide, varying from 12 to 23 yards. In the inferior districts the width varies from 11 and 12 yards down to 3 yards. The houses are, in some cases, built back to back ; but it can scarcely be said that any streets are laid out on such a plan, Dock-street and Queen-street excepted, the latter of which contains about 530 inhabitants." The absence of a Building Act in Preston has been severely felt ; houses in the out-districts have sprung up, fair in their aspect, but most defective in their construction—an

instance of which is given in the drawing of cottages attached to the Report on Preston.

The sites of houses in Ashton-under-Lyne are more favourable than in most of the towns which I have visited. The streets in the newly laid out part of the town are wide and regular, chiefly owing to the judicious regulations of Lord Stamford, to whom most of the property in that town belongs. The streets in the old part of the town are narrow and confined, and the number of inhabitants living in them is computed by Mr. Coulthart to be one-eighth of the whole population. There are few courts in Ashton; and the few which do exist are more favourably constructed with regard to ventilation than those in Liverpool and Manchester. There is no local Act to prevent the erection of narrow streets; but the lord of the manor inserts clauses in his leases to that effect.

The sites of houses in Rochdale are naturally good; but owing to the defective state of drainage are very generally unhealthy. There are some courts unfavourable to ventilation; and the irregularity in the erection of the buildings for the poorer classes, and the frequency of back-to-back houses, increases this evil. The Act for Rochdale contains the usual defects found in local Acts, of not recognising those streets through which there is no right of way.

To Wigan the same remarks apply as to Rochdale, the bad drainage rendering the sites of houses unhealthy. There is a considerable number of narrow streets and courts in Wigan, which is governed only by the Municipal and Highway Acts, and therefore possesses no powers for the regulation of buildings: they are consequently erected with the utmost irregularity; so much so, indeed, that the late mayor, Mr. Eckersley, being asked to describe the usual manner in which streets and courts are laid down, confesses that "it is impossible to describe the varieties in the modes of building."

Great Bolton labours under the disadvantage of being governed by a defective Act, which does not contain any efficient provisions for regulating buildings or other structural arrangements in the town; and, in addition to this, the extreme want of system in the regulations for the sewerage and cleansing of the town renders the sites of houses extremely unhealthy. The adjoining district of Little Bolton is a striking contrast in these respects.

The town of Bury, possessing "no more municipal organization than that of a rural village," has sprung up suddenly into a large and important town, with all the evils attendant upon the want of regulations in the erection of houses. It is not, therefore, surprising that many of the evils alluded to in the case of Bolton are also found in a town possessing still smaller powers. Mr. Harper, the Superintendent-Registrar for Bury, describes these evils in the following portion of evidence:—

"Many of the streets are wide and well laid out, but a large proportion of the houses of the operative classes are built in courts and alleys, some of them close and confined, and closed at the end. Many have a covered entry leading into the main street. In Doctor's-lane, Peel-street, and a street or alley near Barn Brook, a number of houses are built back to back. It is difficult to ascertain the exact number of houses built back to back; but I consulted a very competent person, and he estimated the number within the borough at between 400 and 500."



## DWELLINGS OF THE POOR.

45. The cellar habitations in Lancashire are generally dismal abodes, badly lighted and worse ventilated. Many of them were originally designed for weaving-shops, and were selected for this purpose on account of their dampness. As hand-loom weaving became neglected, the cellars, no long useful as weaving-shops, were converted into habitations for labourers and operatives in factories. The dampness, which had rendered them useful for weaving, was very detrimental as places of residence; but the habit of living in cellars being thus acquired by part of the factory population, the evil has gradually increased, and has been confirmed by the increase of the population, which has been much more rapid than the erection of houses for its reception. I subjoin, in a tabular form, the number of cellars and their population in various towns in Lancashire; the returns (with the exception of the return for Liverpool, which was obtained several years since) being made to me by the police and other authorities of the towns named:—

	Cellars.	Computed Population.
Liverpool . . . .	7,892	39,460*
Manchester . . . .	4,443	18,217
Preston . . . .	600	2,460
Wigan . . . .	95	276
Bury . . . .	150	615
Rochdale . . . .	457	1,747
Bolton . . . .	1,210	4,961

In the case of Manchester the number of inhabitants resident in the cellars was ascertained by actual enumeration, and found to be on an average 4·1 persons to each cellar; in Rochdale a similar enumeration gave the average of 4·007. The number of beds in a cellar is disproportioned to the number of inmates, and exhibits a state of overcrowding to which I shall again refer. Each cellar containing 4·1 persons possesses only  $1\frac{1}{2}$  bed, or, in round numbers, the proportion of beds to persons is 3:8; but there are many cases in which the crowding is considerably greater. Thus, in the examination of cellars in Manchester, kindly undertaken by Captain Willis, there were—

1500 cases in which 3 persons slept in the same bed.

738	„	4	„
281	„	5	„
94	„	6	„
27	„	7	„
2	„	8	„
31 without beds.			

\* So many contradictory statements are made with respect to the cellar-population of Liverpool that I have thought it best to adopt the return given in evidence to the Select Committee of the House of Commons on the Health of Towns. The surveyors to the corporation state that the cellar-population amounts to 20,000; but they are certainly in some error, as in some of the most densely-peopled wards they ascribe only two persons to each cellar; and Mr. Aspinall, the Chairman to the Committee, appointed under the Health Act to carry out its provisions, states that above 23,000 persons will be expelled from those cellars (only the worst-conditioned) which are rendered illegal for dwellings by the Act; while the Committee itself, in the evidence published in the Appendix, describes 8700 cellars as coming under the operation of the Act,—a number equal to a population of upwards of 35,000.

These cellars are almost in every instance undrained, and as frequently badly ventilated. Out of 5529 cellars examined, occupied and unoccupied, in 498 cases the window-sashes did not open, so that the ventilation entirely depended on the door; in some of these cases, however, a second window existed in the back cellar. In many instances the windows, often consisting of a single pane, are so small as to be quite insufficient for ventilation, even when capable of being opened. In Rochdale, during the enumeration, for which I am indebted to the ready assistance of the chief constable of the rural police, there were found out of the 457 cellars examined—

42	containing	6	.	.	.	persons.
17	"	7	.	.	.	"
11	"	8	.	.	.	"
5	"	9, 10, and 11	.	.	.	"

In the smaller towns of Lancashire, and in the undrained districts of the large towns, the cellars not deriving benefit from the surface drainage are frequently in a state which renders them totally unfit for habitation. Mr. Holme, of Liverpool, in describing the state of cellars in that town, alludes to this circumstance:—

“The melancholy facts elicited by previous inquiries clearly show that Liverpool contains a multitude of inhabited cellars, close and damp, with no drain nor any convenience, and these pest-houses are constantly filled with fever. Some time ago I visited a poor woman in distress, the wife of a labouring man: she had been confined only a few days, and herself and infant were lying on straw in a vault, through the outer cellar, with a clay floor impervious to water. There was no light nor ventilation in it, and the air was dreadful. I had to walk on bricks across the floor to reach her bedside, as the floor itself was flooded with stagnant water. This is by no means an extraordinary case, for I have witnessed scenes equally wretched; and it is only necessary to go into Crosby-street, Freemason’s-row, and many cross streets, out of Vauxhall-road, to find hordes of poor creatures living in cellars which are almost as bad and offensive as charnel-houses. In Freemason’s-row I found, about two years ago, a court of houses, the floors of which were below the public street, and the area of the whole court was a floating mass of putrified animal and vegetable matter, so dreadfully offensive, that I was obliged to make a precipitate retreat. Yet the whole of the houses were inhabited!”

Dr. Duncan, referring to Liverpool, and Mr. Holland to Chorlton-on-Medlock, describe the condition of cellars in terms nearly similar, and I have frequently observed the same state of things even in the smaller, as well as in the larger, towns of Lancashire. Thus, in Clitheroe, there is a range of cellars, one or two of them occupied as lodging-houses, in which the beds are raised on bricks, to keep them out of contact with the water, which, during periods of much rain, often rises above a foot in depth.

The inspectors of police in Manchester, while engaged in their examination of the cellars in that town, found numerous instances of a similar kind. Thus, Thomas Heatly says—

“I found the cellars in general very damp, and many of them quite unfit for the residence of human beings. In one very damp cellar, on a wretched bed, I found three persons sick, and on the point of death.”

Sub-Inspectors Butcher, Johnson, and Cohill also report specially on similar instances. In very many cases I have found that the sick



inhabitants of cellars date their sickness, and subsequent poverty and distress, from the period at which they were induced to become cellar occupants. The relieving officer of the Chorlton Union gives evidence on this subject, to which I may draw attention, as generally applicable to the state of cellars in this county:—

“ In my district, which comprises the whole Union, there is a less crowded population than is to be found in Manchester. The front property being occupied very generally by those trading in Manchester, care has, therefore, been taken by landlords to erect such small property as shall least prejudice their more valuable. The most unhealthy dwellings are to be found at the back of those streets in which the petty shopkeepers carry on their trade; and, for the most part, cellars in such places are very damp, and unwholesome for dwellings, each row having at one or both ends a privy which generally soaks through the cellar under it. The courts, having small frontage, are very disgustingly situated, the privies being a part of the back premises, immediately facing the doors of the court dwellings; so that in summer, or at other times when air is let in, admission is given to the effluvia, arising from meanly constructed, offensively daubed, and doorless privies. In cellars, there are persons and families living in comparative comfort, but more generally in a state revolting to humanity; for the most part, cellar inhabitants are brought down to them, either by misfortune or improvident habits. In obtaining the history of such families, I found in a great majority of cases, that they have been occupiers of houses, and have unwillingly sought shelter there, having an abridged income, and the wreck of some furniture saved from an execution for rent or other debt.

“ There is one fact (which, by the way, increases the rent), to which some importance may be attached, that the inhabitants of all cellars deem it essential to have a fire throughout the entire night as well as during the day. I imagine that the greatest privation to cellar occupants is the want of firing; and, when this cannot be obtained, the damp air, overpowering to the constitution, added to the scantiness of bed-covering, brings on a variety of diseases. In regard to the poor under my visiting charge, I find they do not enjoy regular good health when residing in damp cellars; it is, therefore, my practice to report such cases to the guardians of the Union, and hitherto I have been instructed to order and arrange for removal.”

The latter fact he states to be the reason why so little sickness prevails in families chargeable to the Chorlton Union.

Although there are very many instances (perhaps the majority are such) in which cellar dwellings are unfit for residence, there are also cases (when they are situated above the drainage, and possess open areas and means of ventilation) of commodious dwellings which could not be pronounced unhealthy, and are even preferred to more convenient and cheaper residences on account of their independent entrance.

There is only one town in Lancashire, as far as I am aware, which possesses power by its local Act to diminish the number of cellar dwellings. The town referred to is Liverpool, which, by the Health of Town Act (Clause 11), is empowered to prevent a certain class of cellars being let as dwellings. The Act does not seem to have been drawn up with a sufficient knowledge of the difficulties opposed to its due execution. This will be seen by the following extract from the evidence of Mr. Aspinall, the Chairman of the Committee of the Town Council, appointed under the Act to carry into execution its provisions. The 11th Clause of the Act enacts that, after the 1st of July, 1844, all cellars not being 7 feet high, and not possessing a certain size of area,

window, and chimney, and not having attached to it the use of a privy and ash-pit, shall cease to be occupied as dwellings.

“Have you formed any estimate of the number of persons who will be removed from cellars in compliance with this Act?—I think about 5000 or 6000 in courts. I should say that almost all would be removed in compliance with this Act.

“You issued a notice for their removal?—We issued a notice for the 1st of May this year. There was a notice given that they were all to leave before the 1st of May, and we found there were so few that would comply with the Act, that we were obliged to extend it to the 1st of July. What we are to do with those poor creatures when we turn them out, or where we are to place them I do not know. We find it very difficult to remedy the evil.

“Have the public authorities, or any associations of private persons, made arrangements for accommodating so large a number of persons on their removal?—Certainly not.

“Is this clause of the Act compulsory?—Yes.

“So that if you do not obey the Act you may be prosecuted?—We may, if we do not carry out the Act. A great number of those cellars are under corporation leases, and therefore we are just as liable to be prosecuted as the landlord.

“So that, in fact, you are bound to expel 23,000 persons in cellars from their dwellings on a given day, without having provided means of accommodation for them?—Certainly.

“What must be the consequence of such a step?—I am not aware. I should say that a great number of those unfortunate wretches would have to be provided for by the parish.

“Many would go into houses?—Many would go into houses; three or four or five families would go into a house, where only one or two families were before.

“Are there any houses of the poorer sort building upon speculation for the purpose of accommodating those persons?—Not that we are aware of.”

Owing to these difficulties the Act has not been carried into strict operation. Powers have been assumed by the town-council to grant periods of delay for the vacation of the cellars, a book being kept in which the periods of delay are registered. The assumption of these powers, though not strictly legal, has been found very beneficial; and the suppression of cellars, although proceeding much more slowly than contemplated by the Act, is doubtless carried into effect with more security against the evils which would arise from overcrowding the population.

46. The crowded condition of the dwellings, especially the cellar-dwellings of the labouring population, is an evil, which, like many other evils not suppressed in their origin, has become so associated with their habits that they suffer from it even when not compelled to do so by necessity. I know numerous instances of families whose united wages amount to 40s. or 50s. per week, yet possessing only one sleeping-room; so that the grown-up members of the family, male and female, sleep together, often in the same bed. I adduce several (not the most extreme) instances of this kind, out of many which have come under my observation, with a view to show the nature of the overcrowding to which I advert.

CASE I.—*The family, whose total earnings amount to 2l. 2s. per week, consist of the father and mother, who sleep in one bed; a married son and*



his wife, who sleep in the second bed; a grown-up daughter, who with two boys of 12 and 14 years of age, sleep together in a bed on the floor; the whole family being in the same room.

CASE II.—H. H. earns 2s. a day as a labourer; was brought up as a farmer, and had property to the amount of 2000l., which he has dissipated; has a wife and five children, the eldest of whom is 13 years of age, the youngest five years; they have only one bed, upon which the parents sleep, the children sleeping on the floor as they best may.

CASE III.—D. M., with his family, make 30s. per week; his daughter, with a bastard child about two years old, a son about 16, another of 12, and a daughter of 10 years old, making with his wife seven in all, sleep in the same room with two beds.

CASE IV.—J. S. has a father and mother, who live with him; he and his wife sleep in one bed; his father and mother in another; his two grown-up sisters in a third; his brother, a lad of 19, and a young man lodger, "who is courting one of his sisters," in a fourth; all in the same room. J. S. does not know, or will not tell, how much they all make, but thinks it "a good lot," as his wife, and sisters and brother are at factory, himself on a print-ground, and his father a labourer.\*

The above cases will show the nature of the overcrowding—often without the plea of necessity, and far too generally prevalent. Thus in Preston, out of 442 dwellings examined in unhealthy localities, and inhabited at the time of the inquiry by 2400 persons sleeping in 852 beds:—

In 84 cases 4 persons slept in the same bed.

In 28	"	5	"	"	"
In 13	"	6	"	"	"
In 3	"	7	"	"	"
In 1	"	8	"	"	"

And, in addition, a family of 8 on bed-stocks, covered with a little straw. During the severe distress in 1841 an inquiry was instituted into the state of the dwellings of the poor by the Provident Society of Bolton, and a copy of the returns has been kindly furnished by Mr. Brown, the intelligent agent of that society, from which I have made the following abstract:—The total number of families examined amounted to 600, consisting of 2555 persons, average  $4\frac{2}{10}$  to a family. Of these, 48 families, consisting of 194 persons, were wholly without beds, while the remaining 552 families, containing 2361 persons, were in possession of 903 beds, or 1 bed for every  $2\frac{6}{10}$  persons. Of these 903 beds 595 are described as "poor and dirty," 99 as "poor but clean," 196 as "good," and 13 are undescribed.

Similar inquiries have been made in other towns with like results, of which it may be sufficient to specify those in Manchester and Liverpool. In Salford, a town popularly considered as part of Manchester, 41 houses of the labouring class were indiscriminately examined by Messrs. Brownbill and Irving, and found to contain 151 adults capable of work (above 15 years), and 130 children, in all 281 occupants, who possessed 54 sleeping-rooms, or one sleeping-room for every  $5\frac{2}{10}$  persons, and 94 beds, or 1 bed for every 3 persons. Mr. Southam

\* Mr. Holland gives me the following instance, in the case of one of his dispensary patients:—D. F. is a widower with one sleeping apartment, in which sleep his adult son and daughter; the latter has a bastard child, which she affiliates on the father, he upon his son, and the neighbours upon both.

instituted a similar inquiry into 38 houses, indiscriminately taken in Yorkshire and Stable streets, and found the occupants (consisting of 109 adults able to work, and 53 children, in all 162,) in possession of 44 sleeping-rooms, (15 of which were sitting as well as sleeping rooms,) and 58 beds, or 1 bed to  $2\frac{8}{10}$  persons. Of these 58 beds 9 were without stocks, and had only a single covering to each, 3 merely consisted of the bedding, 27 had stocks, but were very filthy and almost destitute of coverings. In Mr. Langton's and Mr. Parkinson's examination of three districts in Manchester, selected as affording specimens of good and bad conditioned districts, the following analysis exhibits the accommodation for sleeping:—

In the ill-conditioned locality, 74 families, out of the 79 examined, possessed only 1 sleeping-room for the whole family, the remaining 5 possessing 2 sleeping-rooms. In 16 of the cases 3 persons slept in the same bed, in 11 cases 4, and in 3 cases 5. In only 14 out of the 79 cases could the beds or bedding in this district be pronounced as good, in 48 cases they were bad, and the remainder were only tolerable or undescribed. In the district selected as forming an average example of residences of artisans, 51 out of the 79 cases examined possessed only 1 sleeping-room, 22 were possessed of 2 sleeping-rooms, and 6 of 3. Out of the 79 cases in this district there were 13 cases of beds for 3 persons, 10 cases of beds for 4 persons, and 2 cases of beds for 5 persons each; 39 cases were described in which the bedding was good, in 20 cases it was tolerable, in 9 bad, and in 11 undescribed. In the third district, selected as a favourable example of residences for artisans, most of the houses being of recent construction, 18 out of the 79 families possessed only 1 sleeping-apartment, the remaining 61 being in possession of 2 sleeping-rooms each. In this well-conditioned district also we find only 10 cases in which 3 persons slept in the same bed, only 2 for 4 persons, and 1 for 5. In 53 out of the 79 cases the bedding is described as good, and only in 6 cases as positively bad.—*Vide s. 77.*

We see from these cases, as far as they go, that, even in average and well-conditioned districts, the custom of overcrowding prevails, but that it diminishes according to the character of the dwellings and the habits of the occupants; for in the district last described there are few Irish residents. In Liverpool no detailed house-to-house inquiry has been entered into; but from the evidence of the Rev. Mr. Johns the same want of sleeping accommodation exists in that town. The evidence brought forward by Dr. Duncan as to the density of the population offers, however, sufficient proof that Liverpool has not escaped this great evil of other towns in Lancashire. Dr. Duncan states that the density of the population of Liverpool, making a deduction for the space occupied by the Docks, is as nearly as possible 100,000 per square mile; and that "there is a district in Liverpool, containing 12,000 inhabitants, packed together in the proportion of 657,963 to the geographical square mile, being nearly  $2\frac{3}{4}$  times the maximum density of London, as stated by Mr. Farr."\*

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\* Mr. Okill, the clerk to the Health Committee, has made other calculations, by which he considers that the proportion of inhabitants to the square mile is 67,840 instead of 100,000 as stated by Dr. Duncan; but Mr. Okill has taken Dr. Enfield's



The number of inhabitants for each inhabited house in Liverpool amounts to nearly 7 (exactly to  $6\frac{9}{10}$ ); and, although this number is considerably exceeded in many ill-conditioned districts in London, the class of houses in the two towns is very different. The number of occupants to each house in a town does not form a fair criterion of the state of overcrowding, unless the size of the houses in the districts compared is nearly alike. In Liverpool the houses inhabited by the working classes are of small dimensions, seldom containing more than three small rooms, while those in London and Bristol are considerably larger, often being let out in flats to different families.

The density of population and overcrowding of apartments, to which I have alluded, is prejudicial to health in many ways, as I shall have occasion to show in its proper place, but it is still more objectionable on the ground of morality. This is especially seen in the lodging-houses for the accommodation of the poorer classes.

#### LODGING-HOUSES.

47. In all manufacturing towns the fluctuating demand for labour necessarily causes a considerable amount of migration, so that meritorious artisans are frequently obliged to leave their homes to seek others of temporary duration. Hence, in all large towns, a class of public lodging-houses has arisen, which have become not only the resort of the travelling artisan and his family, but also of mendicants, vagrants, and too often of abandoned females. In these houses several beds are placed in the same apartment, in which lodgers are accommodated without any regard to difference of age or sex. The usual charge for accommodation varies from 2*d.* to 3*d.* per night; this sum entitling the payer to part only of a bed, and it depends upon chance whether the next applicant is of the same or of a different sex. There are few lodging-houses in which any classification of lodgers is attempted; the only classification ever made being a very unsatisfactory one, and it consists in placing married couples and unmarried females in the same apartment, keeping the unmarried males in a distinct room. This is thought by the keepers of such classified lodging-houses a very decent and highly becoming arrangement, and they increase the charge for this advance towards morality. It is unnecessary to allude to the immense moral evils which must arise from these unregulated lodging-houses. The utter neglect of the ordinary decencies of life, which is occasioned by the indiscriminate intermixture of sexes in the same sleeping apartment, blunts all feelings of modesty, and soon undermines those of morality. I will not dwell upon scenes which I myself have witnessed on entering these dens during the night; but their nature may be easily conceived, and their immoral tendency be rendered obvious, when it is considered that the lowest mendicants, thieves, and prostitutes, make these houses their usual abode, and with these aban-

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return of 2102 acres as the total area, and the return of the Census Commissioners of 1560 acres as the builded area, whereas the latter estimation, more recent than that of Dr. Enfield, certainly refers to the total and not to the builded area. Mr. Okill also conceives Dr. Duncan's calculation of 657,963 to the square mile to be erroneous, and considers that the number should be 505,724; but it is obvious that the calculation of Dr. Duncan refers to the geographical square mile, that of Mr. Okill to the ordinary mile.

doned persons the travelling artisan and his family are thus brought into close contact. These resorts are well known to the criminal police,\* and their evil effects in the production and maintenance of crime have already been brought before the public in the Constabulary Report. I have reduced into the form of a Table the statistics of 691 lodging-houses in various parts of Lancashire, according to a form which I transmitted to the police of the various districts. The Table will itself show, without comment, the great evils both to morals and to public health incident to the present system; and yet the Table, drawn up from returns furnished by the police, whom custom has rendered insensible to such scenes, does not exhibit the evils with sufficient force, as far at least as regards health. Thus I visited many of the houses described as properly ventilated, not one of which I would have included in that class; and this remark applies especially to Liverpool, which, by the Table, presents the most favourable feature as regards health, while the testimony of medical men is directly opposed to this representation. With this exception, referring only to a matter of opinion, which necessarily varies according to the habits and intelligence of the observer, I believe the following Table exhibits pretty fairly the present state of lodging-houses in Lancashire.

TABLE, showing the STATE of LODGING-HOUSES in certain Towns of Lancashire.

TOWNS.	Number of Houses examined.	Per Centage of Houses supplied with Sitting Rooms, (used also as Sleeping Rooms).	Average Number of Beds to each House.	Per Centage of Houses in which Beds for Men and Women are in the same Room.	Per Centage of Houses described as capable of Ventilation by Doors and Windows.	Per Centage of Houses incapable, or scarcely capable of Ventilation, by present arrangements.	Per Centage of Houses described as Moderately Clean.	Per Centage of Houses described as Filthy.	Per Centage of Houses without any supply of Water.	Per Centage of Houses supplied with Water, either from Stand-pipes, or from Pipes laid into the House.	Per Centage of Houses without Necessary Offices.	Per Centage of Houses with Necessary Offices.
Liverpool . . .	201	94.	6.4	33.8	71.8	28.2	40.7	59.2	19.4	81.6	19.5	80.5
Manchester† . .	393	56.	6.1	79.3	52.4	47.6	30.5	69.5	31.1	68.9	50.7	49.3
Salford . . . .	10	100.	5.3	100.	0.	100.	50.	50.	0.	100.	40.0	60.
Bury . . . . .	38	100.	5.5	73.6	71.	29.	18.4	81.6	2.7	97.3	55.3	44.7
Rochdale . . .	17	100.	5.3	82.3	41.1	58.9	47.	53.	0.	100.	53.	47.0
Heywood . . . .	8	100.	6.	100.	62.5	37.5	72.5	37.5	25.	75.	50.	50.
Todmorden . . .	6	100.	5.5	100.	66.6	33.4	66.6	33.4	0.	100.	50.	50.
Wigan . . . . .	18	100.	6.7	72.2	94.4	5.6	22.2	77.7	66.6	33.4	22.3	77.7
Total Average.	691	73.5	6.34	66.2	59.4	40.6	38.5	61.5	25.1	74.9	47.1	52.9

This Table cannot, however, give a fair idea of the wretchedness of

\* Mr. Pritchard, one of the inspectors of the old borough of Liverpool, adduced an instance in the following portion of evidence:—"There is one person who keeps a lodging-house in — street that has three houses together, and in different partitions of the wall he has square holes made, over which there are slides, so that as soon as any person comes in, who is a bad character, he can raise the slide and jump through the hole, till perhaps there are 30 or 40 in the house together. The object of this is to escape detection, in case the police should come in, by their escape from one house into another."

† The return in the case of Manchester will be found to differ from that contained in the published police returns, because the latter refer only to the lodging-houses under the surveillance of the police.



many of these abodes, consisting of back cellars without light or means of ventilation, and containing sometimes as many as eight or ten beds, filled never with less than two occupants in each, frequently with three, and occasionally with four. Dr. Duncan thus describes several lodging-houses examined by him:—

“The cellars, usually the double cellars I have described, are used for the same purpose, and here the over-crowding is carried still further, if that be possible, and is certainly even more prejudicial to the health of the inmates, from the still more defective ventilation of these dark and miserable abodes. At night the floor of these cellars, often the bare earth, is covered with straw, and there the lodgers, all who can afford to pay a penny for the accommodation, arrange themselves, as best they may, until scarcely a single available inch of space is left unoccupied; and in this way as many as 30 human beings or more are sometimes packed together, each inhaling the poison which his neighbour generates, and presenting in miniature a picture of the Black Hole of Calcutta.”

Even when the means of ventilation exist, they are generally unavailable on account of the beds being occupied during the day, either by those who are sleeping away the effects of the previous evening's debauch, or by vagrants resting after the fatigues of a journey. The room, vitiated by occupants during the day, is crowded again and polluted at night; and the insufferable closeness and pestilential atmosphere, which is generally found on entering these dens from the open air, has frequently obliged me to return, without further examination, to breathe an air less contaminated. I have been particular in my inquiries into these low lodging-houses, because I feel convinced that there is an imperative necessity for the interference of the Legislature to protect the public from the effects both of crime and disease, by placing such haunts as these under proper inspection and control.

The low state of physical comfort in the lodging-houses, the miserable ventilation, generally insufficient for a single family, and utterly unfit for numerous nightly occupants, render the inmates particularly prone to contagious diseases. So much is this the case, that, even in the days of Dr. Ferriar, the keepers of lodging-houses were aptly termed by him, “keepers of fever-beds;” and, since his time, many medical men in Lancashire have endeavoured to draw public attention towards them as the nidus of numerous diseases. Dr. Duncan, referring to such houses, says, “Fevers break out from time to time, and spread with rapidity among the inhabitants. Nor is this the worst, for, from the migrant character of their population, these dens become foci, which radiate infection not only throughout the town, but to other towns, and to distant parts of the country.”

Dr. Baron Howard, who has had ample opportunities of observation from his connexion with the Manchester fever-wards, states, that he has drawn especial attention to the disgraceful state of these lodging-houses, “because I consider their evils of a most serious and extensive nature, and I feel quite satisfied that they are the most malignant foci of infectious fevers in Manchester.”

Nor is this to be wondered at, when we consider the utter want of cleanliness prevalent in almost all of them. The permanence of contagion is justly ascribed by Dr. Howard to “the beds and bedding being seldom washed or changed, and generally being in the most filthy

condition, consisting usually of those porous materials to which contagious vapours are especially liable to attach themselves. The danger of sleeping on them may be well conceived; for even if a bed has been occupied by a fever-patient who has died, or been removed, it is often immediately used by fresh lodgers without having undergone any purification." The walls are never white-washed after the death or removal of a fever-patient, nor are there any other means adopted to arrest the progress of contagion. It is, therefore, not surprising that all medical witnesses should be of opinion that they form the foci of malignant disease. On examining the keepers of lodging-houses, they admitted, with few exceptions, that fever had, at one time or another, entered their houses, and some more honest than the rest confessed that it had attacked every inmate; but all of them, fearful, perhaps, that I had some direct purpose in my inquiries, dated the event several years previous to the conversation. In direct contradiction to this, I observed, during my visits, several cases of fever, though certainly not many. In one room containing seven beds, each occupied by two persons, I found a young sailor of about 25 years of age suffering from synochus. His sister, a girl of 20, occupied the same bed; but whether the fever spread among the rest of the inmates I never ascertained. In another house, I found a little girl suffering from scarlatina, and in the same bed slept her father, and, as the keeper of the house said, "any other lodger that might come; times were too bad for poor people to be particular." The unfrequency of the occurrence of these cases observed by a visitor, arises from the care taken by the keepers of the houses to prevent such a discovery. In the two cases I have cited, I observed that there was some anxiety manifested to prevent me entering into a particular apartment, and this induced me to inquire into the cause. When cases of fever occur, the keepers of such houses are anxious to remove the patient as speedy as possible to the fever-ward, to prevent discovery. But the concurrent testimony of all medical men is so strong on this point, that independent of the direct observation of such cases, it would be impossible to doubt that they are the cause of much disease.

The same general features which I have described in the lodging-houses of Lancashire characterize similar dwellings in all parts of the country, and even in Scotland. Mr. Ramsay, the superintendent of the cleansing department of the Edinburgh police, describes the lodging-houses in that city in terms quite applicable to those in Lancashire:—

"The crowded and filthy state of lodging-houses, particularly for some time before and after harvest, the nasty state of their beds, frequently occupied by promiscuous intercourse of the sexes in poverty, rags, and filth, many of them labouring under dangerous and infectious disease, the nightly succession admitted to the same apartments, the same beds and the same bed-clothes, with their wandering and unsettled mode of life, present a condition of things as favourable for engendering and diffusing disease as it is well possible to conceive."

#### PUBLIC SCHOOLS.

48. The crowded lodging-houses show, in a striking manner, the evil effects due to deficient ventilation; and this is equally obvious in public schools, in which the most ordinary principles of ventilation are



neglected. The architects seem to have considered it sufficient in the erection of these edifices to provide a certain number of windows and doors, without making any arrangements for ventilation, independent of these. Consequently, in certain states of the weather, when ventilation is particularly necessary, the windows cannot be opened, so that the scholars are exposed to all the evil effects of inhaling a vitiated atmosphere. Dr. Fleming, of Manchester, examined, with great care, the schools of that town. His report on that subject has already been printed in the Appendix to the Second Report. From his returns I deduce the following abstract:—

ABSTRACT of RETURN made by Dr. FLEMING of the CONDITION of SCHOOLS in MANCHESTER.

Number of Schools examined.	Denomination.	Average Attendance.	Per Centage absent from Sickness.	Number in which Ventilation is Bad.	Number in which Ventilation is tolerable, as far as can be the case, by Doors and Windows alone.	Number with Necessary Offices.	Number without Necessary Offices.	Number with Play-Grounds.	Number without Play-Grounds.	Number with Yards or Waste Grounds instead of Play-Grounds.
13	Infant Schools.	1,645	5	9	4	10	1	4	7	2
19	Day Schools ..	4,666	7 <sup>12</sup> <sub>19</sub>	9	8	16	1	6	5	7
40	Sunday Schools	15,963	9 <sup>8</sup> <sub>8</sub>	15	20	35	4	..	..	..
3	Schools where children are maintained .	215	7	2	1	3	..	2	..	1
75		22,489	7 <sup>1</sup> <sub>7</sub>	35	33	64	6	12	12	10

Note.—The cases in which the Numbers differ from those of the first column, are due to the “Undescribed.”

In considering this melancholy state of structural arrangement in our public schools, it is necessary to understand the principles on which Dr. Fleming has proceeded in describing the state of ventilation:—

“If I have not visited all the public schools in Manchester, I think that upon the annexed list of schools which I have visited will be found a great majority of those most numerous attended. Before I remark upon the ventilation of these school-rooms, I would observe, that everywhere I have found the greatest solicitude among those who had the charge of them in respect to ventilation. During the intervals of absence of the scholars, windows are widely opened; and I doubt not that the school-rooms are generally in a healthy state for the reception of the scholars. The want of ventilation is sufficiently attested by the very ineffectual and partial efforts which have been made in many places for its improvement. My report upon this subject is founded on the following principles:—

“That no room in which hundreds are assembled for hours together can have healthy ventilation, unless there be a *constant* and *gradual* change in its atmosphere proportionate to the volume of air deteriorated by respiration; and that windows, properly so called, can never supply such a change.

“I have gone to a school-room, where I was told they had abundant ventilation by their many windows. I have visited that school-room at three o'clock on the Sunday afternoon when crowded. I have then found its atmosphere insufferable, and all the glass in the windows covered with condensed vapour; and on asking the teachers, ‘Why they did not open the windows?’ they have properly replied, ‘Because it would give the children their death of cold.’

“I have found a well proportioned dome for ventilation in a ceiling closed up because the cold air rushed in so violently. The proof of the necessity

for better ventilation was overlooked, as also the provision of a fitter passage for the entrance of the air required to prevent a vacuum."

The examination of schools in other towns and districts completely corroborates the unfavourable view of their bad structural arrangements. The following table of schools in Preston, which is drawn up from the returns furnished to me by Mr. Ewings, Inspector of Factories, and Mr. Harrison, a surgeon in that town, who kindly undertook the examination at my request, will afford sufficient evidence of this fact.

TABLE showing the state of STRUCTURAL ARRANGEMENTS in SCHOOLS at PRESTON.

Number Examined.	Denomination.	Number of Children in Daily Attendance.			Area for each Child.	Cubic Space for each Child.	Number in which the means of Ventilation depend on the Windows alone.	Number in which there are Ventilators, independent of Windows.	Average Area of Play-Grounds.
		Boys.	Girls.	Total.					
9	{ Church, or National Schools }	896	918	1,814	3·87	5·9	..	..	107 yards, 2 feet
3	{ Roman Catholic Schools }	564	520	1,084	3·31	5·9	2	1	212 yards, 7 feet.
1	{ Wesleyan Schools }	100	70	170	3·4	5·69	..	1	145 yards.
1	{ Endowed School (Blue Coat) }	24	24	48	2·6	4·67	1	..	Small yard, with pig-sty.
13	{ Schools of Private Teachers }	525	138	663	3·5	5·6	11	2	In two cases only play-grounds —80 yards.
35	{ Cottage Schools }	385	425	810	2·44	3·58	34	..	..

*Note.*—In two cases in the National Schools, ventilators are introduced, but only in certain departments of each of the two schools.

With the exception of the Wesleyan school, all the schools are described as very defective in privies and in drainage, little or no care being taken to prevent putrid emanations. The sites of the schools have been fixed without any regard to the health of the scholars; an instance of which is seen in Christ Church School, Bow-lane, which is thus described by the visitors:—

"It is situated in the lowest part of the street, which slopes from both extremities to the position of the building. It is erected over one of the principal sewers of the town: to the east there is a factory, to the west a number of mud-traps, where all the solid part of the drainage is preserved; and a little beyond there are several meadows flooded from the drain. The room in which the boys are taught is considerably below the level of the adjoining street, and appears to be very damp: the children look pale and unhealthy, and 10 on an average are said to be absent from sickness. The late master ascribed his death to the unhealthiness of the room."

Many of the other schools are equally badly situated; some are in the vicinity of pig-sties, and some in courts. Even in those schools in which provision is made for ventilation independent of the doors and windows, the most gross ignorance is frequently manifested as to its first principles. In St. Mary's school, while there is a good arrangement for ventilation around the stove-pipe, the ventilator from the boys' school passes into that occupied by the girls', so that they are obliged to breathe the air already vitiated by the school beneath. The general means for ventilation are those supplied by the windows and doors,



which often cannot be used for this purpose on account of the catarrhs and rheumatisms which result. The average cubic space in which each child has to exist, is about 5·9 cubic feet; and when it is considered, that nearly double this amount of air passes through the lungs of a child, and is vitiated every hour, it cannot be considered surprising that the inmates of public schools thus deprived of an adequate supply of fresh air, should suffer such a large amount of sickness, or that they should exhibit in their outward appearance the signs of a weakly and puny childhood. It is quite amazing to observe the difference in the appearance of children attending a well-ventilated, and well-regulated school, and of those who attend schools of an opposite description, especially such as are usually denominated cottage schools. The sanitary disadvantages under which children labour in most of our schools, are so much opposed to their mental progress, that nothing would be more conducive to the rapid advance of education than attention to structural arrangements. It is by no means an uncommon thing, on entering public schools, to observe children carried out in a fainting state, and the visitor, who feels the contaminated state of the air on entering it from a purer atmosphere, cannot be astonished at the occurrence.

The effects upon health are best seen on those scholars who are also subject to depressing physical agencies at home. This will be seen by Tables in the second part of this Report. The first part of these Tables was drawn up from Returns furnished to me by Mr. Mather, the treasurer of the old church parochial charity-school in Liverpool, who states that they may be relied upon, on account of the care which is taken in these schools to ascertain the true cause of absence of each scholar. When such cause is alleged sickness, the masters are instructed to visit the child and ascertain the truth of the statement, which is then entered into a book kept for the purpose. This Table gives the very interesting result, that in Moorfields school, 27 per cent. of all the scholars who live in cellars are constantly absent from ascertained sickness, while only  $3\frac{3}{10}$  per cent. of those who live in houses are absent from the same cause. In St. Matthias school  $16\frac{4}{10}$  per cent. of cellar occupants are always absent from sickness, and only  $3\frac{7}{10}$  of those who live in houses. It will be observed by the Table that the enormous amount of 70 per cent. of the infants living in cellars, who attend the Moorfields infant-school, are always absent from sickness. This illustrates strikingly the effect of vitiated air on those already depressed by other physical causes of disease: for the school in which this terrible extent of sickness occurs, was, when I visited it, an attic of about 12 feet square, with only one window, and into this room 56 poor children were crowded: they had no play-ground, and looked pale, sickly, and dispirited. The Table referred to is full of instruction: for example, we find that the infants in St. Matthias school have less sickness than the girls and boys in the same building; and the reason seems to be, that the room in which the former are taught is provided with ventilators, independent of the windows; in the case of the rooms appropriated to the two latter, the windows cannot be opened sufficiently often, on account of the vapours from a neighbouring lime-kiln.

Table II., drawn up by Dr. Smith, is adduced as confirmatory of the one already alluded to. Being desirous to ascertain whether the

numbers obtained in Liverpool might be taken as a fair expression of the effects of different classes of dwellings in other towns, in producing sickness, Dr. Smith undertook a similar inquiry into various schools in Manchester, but with this difference, that he ascertained by personal examination, with the aid of the master, the cases of absence from decided sickness for the previous month, noting down at the same time the class of dwellings. This was the only method of approximating to accuracy, as the causes of absence are not ascertained or registered. The results of this examination will be found to be strikingly corroborative of the return from Liverpool. Out of six schools examined, containing 1442 scholars, 11 per cent. of scholars who lived in houses in streets were frequently absent from sickness, 34 per cent. of those living in houses in courts, and 41 per cent. of those living in cellars.

In an examination of nine schools in Bolton, containing 1498 scholars, by Mr. Brown, under the direction of the Rev. Mr. Birley, 30 per cent. were found to have been ill during the last 12 months, the average duration of illness of each case being three weeks and two and a half days. In this return, the difference in sickness of those living in streets and cellars amounts only to one per cent. in favour of the former; but this exceptional result is obviously due to the small number of cellar occupants examined, only 100 out of the 1498 being inmates of this class of dwellings.

Several marked instances of the injurious effects of bad ventilation were observed in the schools of Manchester, as is shown in the following portion of the evidence of Dr. Fleming:—

“The infant-school in Lower Mosley-street was insufferably close the day I visited it. The only mode of ventilation is by throwing open the windows above the backs of the heads of the children, the forms being ranged round the room. It did not surprise me when I was told, in the language of my informant, ‘that the children suffer very much from tooth-ache, and in sharp winds, from bad coughs. They suffer from these two causes more than from any other.’”

“On inspecting the blue-coat boys, I observed a cutaneous eruption on the hands and arms, and I have seen it since on the bodies of some of the boys. Three whom I examined looked delicate, and appeared to suffer from indigestion. On inquiry, I found that this disease (I should call it scurvy) had prevailed some time ago to a more alarming extent, and that it was comparatively subdued. The first relief they obtained was from a change in diet, giving a portion of meat every day with beer, and more potatoes, and less bread.

“I desired to be shown into the dormitories, where I saw large apertures had been recently made in the side walls near the ceiling. I was informed that the object had been to improve the ventilation, and that they had to a great extent answered the purpose. Upon comparing dates, it seemed clear that the disease to which I have alluded, though relieved by change in diet, assumed a much milder form from the time of the alterations in the dormitories, and is now almost overcome.”

Other diseases arising from removable causes have also been observed in schools, for Dr. Fleming observes:—

“I ascertained that at the ladies’ jubilee charity school, some years ago, the house was supplied with water from the Strangeway’s pool; that at that time swelled glands were frequent among the children, and that leeches were constantly required. Since they have used the filtered stone pipe water



leeches have seldom been wanted, and swelled glands are comparatively of unfrequent occurrence."

It is at the cottage schools, however, that the evils of structural arrangements are most observed. These schools abound in all large towns, and, according to the Preston returns, are used by about one-fifth of the children of operatives. These cottage schools are generally situated in courts or dirty lanes, and surrounded by, and often themselves contain, filth of every description. Some were found over stables, some have their windows opening to the exposed cesspools which I have described as generally present in courts; some even are found in cold and damp cellars. I found one in Thornley-court, in Manchester, situated close to a "bog-hole;" all the scholars, except three, being absent, at the time of my visit, from sickness, which the dame represented as scarlet fever and measles. In every house in the court there was a case of severe illness. In the house adjoining the school and cesspool, a man had a severe attack of dysentery; in the next, in a damp miserable cellar, lay a mother and daughter, both of whom had been in bed for ten days, the one with rheumatism, the other with hooping cough. The next house contained a man on the point of death from consumption, whose disease had been progressing in this miserable abode for 11 months; the wife of this man had seven children, five of whom were dead—three died in this court, one of small-pox, one of hooping-cough, and one of "weakness of the limbs." The lower floor of the next house was occupied as a sitting-room, although the greatest part of it was taken up by an ass, and its abominably filthy litter. I was not surprised when the only inmate of the house informed me that her husband was then in the fever ward, and was not expected to recover; nor was I astonished when she told me, with tears flowing down her sickly cheeks, that her son had lately died. "He was struck on the shoulder with a beam, but there was no mark left. The doctor said his body was bad throughout, and he never recovered." I have described this case as an instance of the unhealthy localities in which cottage schools are sometimes situated. Unfortunately, the case is no uncommon one; out of all the cottage schools examined in Preston, only one is situated in a dry airy situation, and is well ventilated. The teachers are generally females, who have, in some instances, other occupations. In one case 36 children were crowded in a small room above a shop belonging to the mistress, who had to leave her children at the call of every customer. Some of the rooms used as schools are so small that the children have not room to sit down. In one instance each scholar had an area to stand in of only  $1\frac{4}{16}$  square feet, and a space to breathe in of  $2\frac{5}{16}\frac{7}{6}$  cubic feet. Messrs. Ewings and Harrison, in examining the cottage schools of Preston, found in several instances one portion of the scholars in the kitchen, and the other in the back yard seated on coals or blocks of wood.

In Liverpool the dame schools are especially bad, as will be seen from the following portion of Dr. Duncan's report (First Rep., Vol. I. p. 146):—

"Another source of mischief which ought to have been noticed previously, and which I am convinced must contribute its share to the disproportionately great mortality of childhood in Liverpool, is to be found in the state of the dame schools and common day schools in the poorer parts of the town. In

these schools, where very little is even professed to be taught, and which are frequently held in cellars or in garrets, children are often crowded together, for two or three hours at a time, in numbers which soon render the atmosphere of these ill-ventilated apartments most oppressively close and prejudicial to the health of the scholars—an effect which is evidenced by their exhausted looks and languid air, after having been an hour or two confined. Mr. Riddal Wood, who spent some time in Liverpool about seven years ago in investigating the state of education in the borough, found that there were at that time 244 dame schools with 5240 scholars, and 194 common day-schools with 6096 scholars. In his report to the Manchester Statistical Society, he says, ‘The condition of most of the schools in an extensive and populous district, stretching upwards from the North shore to Scotland-road, is wretched in the extreme, corresponding in a remarkable manner with that of the population. With few exceptions, the dame schools are dark and confined; many are damp and dirty; more than one-half of them are used as dwelling, dormitory, and school-room, accommodating in many cases a family of seven or eight persons; above 40 of them are cellars.’ ‘Of the common day schools in the poorer districts,’ (he states in another part of his report,) ‘it is difficult to convey any adequate idea. So close and offensive is the atmosphere in many of them, as to be intolerable to a person entering from the open air, more especially as the hour for quitting school approaches. The dimensions rarely exceed those of the dame schools, while frequently the number of scholars is more than double. Bad as this is, it is much aggravated by filth and offensive odour arising from other causes. Mr. Wood states that the masters and mistresses were generally ignorant of the depressing and unhealthy effects which surrounded them, and he mentions the case of a mistress of a dame school, who replied, when he pointed out this to her, that ‘the children thrived best in the dirt.’ He notices particularly a school in a garret up three pair of dark broken stairs, with 40 children in the compass of 10 feet by 9, and where on a perch, forming a triangle with the corner of the room, sat a cock and two hens! Under a stump bed immediately beneath was a dog-kennel, in the occupation of three black terriers, whose barking, added to the noise of the children, and the cackling of the fowls on the approach of a stranger, was almost deafening. There was only one small window, at which sat the master, obstructing three-fourths of the light it was capable of admitting.’ In Manchester, so far as I can judge from the report of the Committee of the Statistical Society, the schools for the working classes, especially the day schools, are somewhat better than those in Liverpool, although the dame schools are described as being deplorably bad. ‘Neither in Manchester nor Liverpool was there a common day or dame school where there was a play-ground, where the children could get the change necessary for young persons.’ In Birmingham, Mr. Wood stated to the Committee on the Health of Towns, that, taken, as a whole, the state of the dame schools was much better than in Liverpool and Manchester. ‘They were small rooms, but generally on the ground floor, and not, as in Liverpool and Manchester, frequently in cellars or garrets.’”

I have already said that the difference of appearance of scholars in well and badly ventilated and conditioned schools is so obvious, and the effects upon their future health and working ability so apparent, that I am sure the masters of all such schools would hail with much pleasure any measure which may be adopted for their proper inspection and regulation. In every instance (the dame schools excepted), I found the utmost willingness on the part of masters to attend to the health and physical comfort of their scholars, but absence of facilities for improvement, or ignorance of their proper nature, prevented the accomplishment of their wish.



## PUBLIC PARKS.

49. In nothing, perhaps, are the large towns of Lancashire so generally deficient as in public parks for the recreation of the working classes. With the exception of Preston, none of the large towns have parks or public walks worthy of the name. In that town, however, the authorities have shown a laudable desire to secure proper places for the recreation of the working classes, and they are still continuing their exertions to procure additional facilities for this purpose. Preston is in possession of a public park of 200 statute acres, another smaller one of 30 acres, and a walk, which at present is about 150 yards long and 15 yards wide, ornamented with lime-trees, and commanding a splendid view of the beautiful valley of the Ribble. This walk is about to be extended, the corporation being at present engaged in negotiations for the transfer of some property necessary for the extension.

Manchester, which has hitherto been entirely destitute of public places of recreation for her artisans, is now making active exertions to supply the deficiency; and from the zealous manner in which the object has been brought forward, and from the large amount of subscriptions in support of it already raised, there is little doubt that this very desirable object will soon be carried into effect. There are several walks around Manchester, which at present are much resorted to, and if means were taken to prevent illegal encroachments upon them, much good might thus be done. It is a serious complaint, made by well-informed persons in the various towns visited, that there are no means readily available for the protection of the public interest in this respect. If an owner enclose a part of his property, through which the public have a right of way, there is great difficulty in asserting and maintaining that right, for the public, as a body, is too cumbrous a machine for the prompt assertion of its privileges. The evil had attained such an extent in this county, that a private society was formed for the purpose of prosecuting owners who illegally closed public paths; but, although it was productive of much good, yet being too limited in the sphere of its operations, and lately having got into almost total abeyance, the evil has gone on increasing.

Liverpool possesses no public park for the exercise of its unhealthy population, as will be seen by the following statement of the Health Committee:—

“There is a public garden maintained by the corporation on the south-east side of the town, in which neighbourhood there are some large squares on similar plans to those of London, and wide open streets, suitable for air and exercise. Along the river front of the town, there are spacious walks, viz., the King’s parade, 300 yards long; George’s Dock parade, 200 yards; Prince’s Dock parade, 700 yards; and at the front of the North Dock, 700 yards: and all the piers of the dock entrances are open to the public. But the river, and the convenience of steam navigation are the chief attraction, as frequently 20,000 persons pass over the river to Cheshire on Sunday, to enjoy their walk in the adjoining county of Cheshire.”

The very fact here stated of the numbers who flock over to Cheshire to breathe a pure atmosphere shows the avidity with which such a benefit would be seized upon at home.

The absence of all precautionary or remedial means for the care of the general health may find some apology in those towns which, having

little or no public revenue, are unable to undertake them. But what excuse can be offered for the depressed sanatory state of a town like Liverpool? Enjoying an enormous public income, its population is, at the same time, weighed down by disease and mortality, which far exceed that of any other town in the kingdom; the average age attained by its inhabitants is lower than can be found elsewhere; and more than one-half of the children born in the town are swept away before they reach the fifth year of their age! And yet these fearful miseries are susceptible of almost entire removal at a pecuniary cost much less than that with which the community is actually burdened, in consequence of their existence. A large portion of the municipal revenues of Liverpool are devoted—very properly—to the erection of magnificent buildings for the adornment of the town, and to the formation of other structures for the aggrandizement of its commerce. But surely the labourers and artizans, by whose toil these evidences of wealth are reared, may claim some consideration! Surely it is desirable—nay, imperative—that their wretched homes should be made fit for the residence of civilized beings, and their own physical and social condition meet with the sympathy and attention to which it is indisputably entitled. Let me not be understood as insinuating that the authorities of Liverpool have directed the income of the town in any other way than in their conscience they have thought the best; but, with strange pertinacity, they have refused to give credence to the authentic accounts of the unhealthiness of the town; and, with an ingenuity worthy of a better cause, have endeavoured to escape the force of the returns presented to them. The reasons which they have assigned for their incredulity, and an examination of these reasons, I have appended to this Report; and to that portion of the Appendix I would beg to direct the special attention of your Board.\*

I have ventured to make the above observations because I feel assured, from the well-known energy and liberality which characterize Liverpool, and which are strikingly evinced in several of its public charities, and from the zeal and activity with which public measures are prosecuted, that its sanatory condition will be quickly and decisively improved as soon as the authorities are convinced that their attention is required to the subject. If my examination of the causes affecting the health of the town tend to the promotion of this object, I shall consider the time and labour devoted to it as amply repaid.

#### PUBLIC BATHS AND LAUNDRIES.

That the municipality of Liverpool has only to be convinced of the necessity for taking immediate steps to arrest the progress of disease there is most satisfactory proof in an important sanatory provision recently made by them, and in which they stand alone—in advance of all other towns: I allude to their public baths and wash-houses. I have already forwarded to you details on this subject (First Rep., Vol. I. p. 292), from which it appears that the baths, erected by the Corporation in 1842, at a cost of 2300*l.*, exclusive of land, have been increasing in use; and that from June, 1842, to June, 1843, they were resorted to by 12,836 persons; 7691 of whom used the warm, and

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\* In this edition these reasons are given in an abridged form.



4133 the cold bath. The number of applicants is still on the increase, but the persons using them are not found to be of the poorest class. During the two weeks ending respectively August 10th and 17th, 1843, the baths were taken by—

	1st Week.	2nd Week.
Poor persons unable to pay . . . . .	15	36
Mechanics and others able to pay . . . . .	373	474
Respectable persons paying for a private bath	98	106

The deduction drawn from these numbers by the committee of the town council, who have charge of the baths, is, that the price of the cold bath should be raised from 1*d.* to 2*d.*, that of the warm bath from 2*d.* to 3*d.* This decision to raise the price so soon after the establishment of the baths is much to be regretted, especially when the total loss from the baths and wash-houses together was only 108*l.*, an amount which ultimately would have been reduced by a continuance of the system. While mechanics may still be enabled to pay this increased rate, those for whom the benefit is particularly desirable are deprived of all the advantages. I would refer to the Report itself for information regarding the wash-house, an admirable institution, which is well deserving of imitation, and the benefits of which are about to be extended in Liverpool by the erection of another building in a different part of the town. It may suffice to remark here that the charge for the use of a tub for six hours is only 1*d.*, and that the Corporation, with commendable liberality, charge nothing for washing infected clothes, and this doubtless aids in retarding the propagation of contagion. The benefits thus placed within reach of the poorer classes—many of whose families occupy only a single room, by the establishment of wash-houses, are greater than at first sight they appear to be. The Corporation have also built public baths at St. George's docks, but as they have let them upon lease, and as the price charged for their use prevents their being resorted to by the working classes, it is unnecessary to refer to them in detail.

Liverpool is the only town in Lancashire which can boast *public* baths. This is the more to be regretted as all the towns in this county possess great facilities for their erection. When we consider that the waste water of a 500-horse engine would yield a supply sufficient to bathe 26,000 persons per diem, at a temperature varying from 70 to 110 degrees (First Rep., Vol. II. p. 81), or that its application to wash-houses would furnish a supply of water "larger than would be required for a whole county," the facilities for the erection and economical maintenance of such establishments in all the manufacturing towns of Lancashire must be at once obvious; and no excuse can henceforward be made for places which enjoy this cheap and ready means of founding such health-giving institutions, and yet remain blind or indifferent to their benefits. Such an application of waste water has been introduced into one or two factories for the use of the workmen employed in them, but in general the mistake has been made of erecting the baths at such a distance from the hot well of the engine, or from the waste pipe, that the water is cold before its arrival at the baths; so that, as has been shown by the experience of Liverpool, the applications for their use are not numerous. In making some inquiries as to the cost of erecting baths I have been much assisted by Mr. Coulthart, whose evidence on this subject has already been adduced (First

Rep., Vol. I. p. 301). From specifications and plans furnished by him, it appears that a bath-house, containing 16 or 18 warm slipper baths, 2 Buxton baths, 2 Matlock baths, 2 shower baths, 2 sulphur baths, and 2 large swimming baths, besides the necessary rooms, and all other appliances, might be built and fitted up for 3000*l.*, or with a handsome architectural front for 4500*l.* It is understood that the committee for obtaining public parks and walks in Manchester have it under consideration to devote a portion of their funds to the establishment of public baths.

#### SUPPLY OF WATER.

50. I now proceed to a most important point in connexion with the sanitary condition of towns, viz., the supply of water.

I will first consider the circumstances of those towns which possess *no constant* supply either for domestic purposes or for the extinction of fire; and, secondly, of those in which a *continuous* supply is furnished. The following list of large towns in Lancashire shows the numbers dependent on each system:—

1st. Intermittent system, or method of occasional supply at low pressure	{ Manchester, Liverpool, Bolton, Wigan.
2nd. Natural system, or method of continued supply at high pressure* . . . . .	{ Preston, Ashton, Oldham, Bury, Rochdale.

In Liverpool the water is laid on only on alternate days, or (as Sunday is excepted) three times in the week. The hours of service vary from 1 to 2½, during which time all the water necessary for two days' consumption must be collected; and if, by any chance or necessity, the tenant be absent from home during these hours, and his previous supply be exhausted, he is deprived of water for four days. This mode of supply is stated by cottage tenants to be a great inconvenience, especially by those who are unable to afford cisterns capable of containing a supply sufficient for more than two days; and this class of tenants perhaps forms the majority. In such cases they are obliged to collect the water in whatever vessels they can most conveniently procure; and even when this is effected, its retention in the sitting-room, where it becomes heated, and absorbs vitiated air, renders it unpleasant as a beverage, and induces the tenant to resort to other injurious modes of allaying thirst. The collection of a proper quantity is no easy task, when it is considered that, by the experience of Nottingham and Preston, the average consumption of water for a cottage should be 40 or 45 gallons per diem; although, according to the evidence of well-informed witnesses, the cottage consumption, in Liverpool, even in the case of a family of more than ordinary cleanliness, rarely amounts to 20 gallons daily.

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\* It is curious as illustrative of the use of a general inquiry, that the authorities in certain towns of Lancashire were ignorant of the existence of the natural system in their own county; and one town sent their surveyor to Nottingham, who reported the system to be impracticable.



The inconvenience of collecting water in vessels wanted for other purposes affords so many inducements for its sparing use, that a proper degree of cleanliness in the houses of the poor is prevented; and the quarrels which ensue on the collection of the water from taps common to many houses are found to be very injurious to the morals and peaceable disposition of the poorer classes; so much so, indeed, that Mr. Rushton, the police magistrate, states that a large proportion of the cases of assault brought before him are traceable to the disputes engendered by this mode of supply. Such are some of the complaints which everywhere are heard in Liverpool; but they certainly point out only a few of the evils incident to the present system. Let us suppose that all the houses in Liverpool are supplied with water (for, singularly enough, the two Companies state that they supply together 45,758, being 1424 houses *more* than exist in the whole borough); and let us suppose that they all possess tanks for its reception, which they all should possess on the system of intermittent supply,—then a capital of 91,516*l.* would be sunk in tanks alone: for it is stated in evidence that, taking one house with another, the cost of tanks, with their usual appendages of cocks and balls, is from 2*l.* to 4*l.* each. Now, for the miserable supply of two hours three times in the week, the charge is 5 per cent. on the rental of houses below 6*l.*, a sum which we may assume to be the average rental of the poor class of cottages; on this assumption, 8*s.* 2*d.*, viz., 6*s.* for water, and 2*s.* 2*d.* interest on cost of tanks, forms the lowest sum for which a *proper* supply of water on the *intermittent* system can be obtained for a poor man's cottage in Liverpool. This sum is paid by the landlord, who remunerates himself by charging the tenant an additional rental of 3*d.* per week. Thus, (I cite cases observed by myself,) when the rent of a cottage amounts to about 7*l.*, the water-rent paid to the Company will be 7*s.*; but the actual additional rent paid by the tenant to the landlord is 13*s.*, the excess being charged to defray the interest and expensive dilapidation of water-tanks. The charges in Liverpool for a stinted and intermittent supply of water are nearly double those charged for a constant and unlimited supply at Nottingham, Ashton, and some other towns.

I have stated that there are two rival Companies in Liverpool, and yet, with this competition, it is clear that the price of water to the labouring man is unreasonably high. There are two sets of mains, two sets of officers, and two capitals, upon which interest must be paid ultimately or immediately by the public before the Companies themselves can receive profit. Had either of these Companies acted on the principles pursued in other towns, under a proper supervision, there can be no doubt that it could have furnished a full and continuous supply of water at a price much more moderate than the present one.

The insufficiency of the two existing Companies for the performance of an important service for which they ought to have been prepared, viz., the extinction of fire, compels the formation of a third establishment at an outlay of 50,000*l.*: to this subject I shall have occasion to return.

It is unnecessary to say much as to the supply of water in Manchester; for the remarks applied to the Companies in Liverpool are equally applicable to that in Manchester, with this exception, that the latter serves its tenants from one hour to four hours every day, instead

of three days each week. But the same intermittent supply the same necessity for tanks, the same obstacles to the preservation of cleanliness in houses, or to the extinction of fire, exist in both towns. There are many streets in Manchester into which mains are not yet laid; though improvement in this respect is in daily progress. The statistics, as far as they have been obtained, will be found in the Reduced Table of Returns supplied by the various Companies. One very gratifying feature in the Manchester Water-works Company is, that they have recently shown much solicitude to obtain an adequate quantity of water, and have resolved to adopt means to furnish a continuous supply at high pressure—the details of which have already been made public. At present, however, the system is quite unequal to the wants of the inhabitants of a town like Manchester; and the price to the poor varies from 5s. to 12s., according to the rental. Many cottages are supplied by taps common to a group, and very many others by private pumps or wells; the scanty supply from which is generally as costly as the unlimited quantity furnished on the Nottingham or Preston plan.

According to the return of the Company, about 30,000 houses, including public buildings and works, are supplied with water, but this number must not be supposed to indicate that all these houses have water laid on; but, even were this the case, 27,000 houses would still be without a supply. On the present system, an additional outlay of 60,000*l.* for tanks alone, with at least an equal sum for the extension of works, would be required, whereas, to procure an unlimited quantity of water at high pressure, 96,000*l.*, or an annual sum of about 700*l.* for one million gallons daily, is thought to be all that is requisite, both for the supply of works and for houses, in addition to the present amount.

Wigan, another town supplied with water by a company on the intermittent system, is very scantily and irregularly served, according to the evidence of a committee of the inhabitants. From the company itself I could obtain no specific information, but according to the statement of the mayor of Wigan—"There are constant complaints as to the quantity, quality, and price of the present supply, and there are no means of redress, either to the public or private individuals."

The company have eight stand-pipes in the town, at which the working classes are supplied with water at the rate of 1*d.* per week, an enormous price when it is considered that the water has to be carried to the houses, and is only available one hour each day.

From Bolton, the only remaining town acting on this old intermittent system, I could obtain no specific returns; there seems, however, to be a fair supply of water as to quantity and quality, but there are many complaints with regard to the price, which varies from 10s. to 40s., according to the rental of the house. There are a few public *pumps* to which the poor can resort to escape this high price, and these are so much crowded, that all the evils of stand-pipes, as pointed out by Mr. Hawksley and other witnesses, and alluded to in the case of Liverpool, have been felt in full force. At one public pump 63 people were counted at one time by a witness examined. The Bolton Provident Society, with an enlightened benevolence, aided very materially in the erection of a reservoir on Bolton Moor, from which there will be a gratuitous distribution to stand-pipes in various poor parts of the town.



51. The objections to the intermittent system of supply are sufficiently numerous and powerful, when viewed with reference to domestic economy, but are much more so, when considered in relation to a very important application of water—the extinction of fire, and preservation of property. In the case of all the towns to which I have alluded as obtaining water on the intermittent plan, the arrangements for the extinction of fire are very imperfect. In some of the larger towns the principal mains are always full of water; but generally it is “on,” only at stated intervals during the day, and turned off entirely during the night, so that if fires occur at that period, as most frequently is the case, there is no water immediately available for their extinction. In Manchester and Liverpool this want has been felt so severely that water is carried with the engines. It is well known how important an immediate supply of water is at the commencement of a fire, and of how very little use it is, except for the protection of adjacent property, when the fire has been allowed to attain a certain height. On the present system in the towns alluded to, before the heavy engines can be drawn to the scene of the fire, or the turncock aroused to lay on water to the mains, from fifteen to twenty minutes—sometimes an hour—elapses, a time sufficient to cause the loss of property and life to the most serious and distressing extent. Mr. Moore in 1842 showed that during the previous 47 years, a loss of property by fire had been incurred in Liverpool, amounting to 2,000,000*l.*; and in the very year in which his report was made, 517,927*l.* worth of property, was thus destroyed. Mr. Corbett, a member of the Fire Committee of the Manchester Police Commission, before its powers were transferred to the Corporation, states that he had often reason to be much dissatisfied with the delays which occurred in procuring supplies of water for the engines on their arrival; and he estimates the loss to the public from this circumstance to have been 100,000*l.* in seven years. But the best indication of the loss is seen in the enormous premiums now charged by insurance companies for insuring buildings against fire—premiums almost prohibitory to insurance.

As an inquiry into the arrangements now existing with respect to fire is mentioned specially in Her Majesty’s Commission, I subjoin, in a tabular form, some information collected regarding these arrangements, by which it is shown that fires are much more frequent in towns supplied on the intermittent, than in those supplied on the continuous system :—

TABLE showing the ARRANGEMENTS for the protection of PROPERTY against FIRE in various Towns of Lancashire.

Towns.	Number of Houses.	Average Number of Fires per Annum.	Is Water kept on Day and Night in the Mains so as to be in constant readiness ?	What length of time usually elapses before a full Supply of Water can be obtained ?	Number of Engines kept by the Authorities.	Number of Fire-men.	Proportion of Fires to Houses.		
Intermittent supply.	Liverpool	44,326	116	No.	{ 15 or 20 minutes, some times 1 hour }	20	64	1 in 382	
	Manchester	45,991	60	No.	{ 15 or 20 minutes . . }	9	52	766	
	Salford . .	11,247	22	No.	20 minutes . .	3	22	512	
	Bolton . .	10,761	16	No.	Very long . .	4	26	672	
	Wigan . .	4,917	?	No.	{ No plugs or available supply. }	2	2	?	
Constant supply.	Preston .	9,984	8	Yes.	Instantly. .	{ 3, principally by hose, without the use of engines. }		14	1248
	Ashton . .	4,700	1	Yes.	Ditto . . . .	2	12	4700	
	Bury . . .	5,260	2	Yes.	Ditto . . . .	(9 private)	0	2630	
	Rochdale .	8,266	?	Yes.	Ditto . . . .	5	?	?	

52. It will be observed that four towns kept a constant supply of water in the mains. Preston and Oldham,\* however, seem to be the only towns which have discovered the advantages offered by the natural system for the extinction of fire. For the last four years, the practice has been, on an alarm of fire, instantly to screw a hose to a plug, and by means of it to throw the water to the top of the highest building which may be on fire, without the intervention of the fire-engine. This plan is found to possess so many advantages, that it is adopted in every case in Preston. The engines are entirely dispensed with, as will be seen by the following evidence of Mr. Samuel Bradley, the Superintendent of the fire brigade:—

“How long have you been superintendent of the fire police in Preston?—Three years in Preston, and I was sixteen years in the Manchester fire brigade.

“Have you had any fires lately?—There was one in a cotton warehouse about two weeks since. The fire was put out with the hose without the engine. The hose is on a reel on the engine, but we much prefer to use the hose alone. We unwind it, screw it on the plug, and use it instead of the engine. For the last two years we have never used the engine. The hose is more effectual and more rapid in its operation. The water by the hose can be thrown over the highest building.

“Why do you prefer the hose to the engine?—Because it is much more handy, can be easier taken into any part of the building, and requires much fewer hands to manage it.

“Do the factories keep hoses?—Several of them do; Mr. Rogetts, of Pitt-street, has such a hose, and he has put out a fire at least once, I think twice, by the hose before the engine was called.

“From your experience in the fire brigade in Manchester, do you think that by means of the hose screwed to the water-plug you can extinguish fires more quickly than could be done in Manchester with the engines?—In Manchester there was some delay, owing to the water being off at times. Here they can put on water in thirty seconds after reaching the fire, and the

\* No return of the fires at Oldham has been made.



pressure being stronger at night in the main than in the day (owing to there being no use for it at that time), I am sure the system pursued here is more effectual and rapid.

"Would it not be much better to have a hose-reel, or hoses, in different parts of the town, instead of dragging up to the fire a heavy engine, which you do not use?—It would be very much better, and I am very anxious that the commissioners of police would enable me to do so. The reel must be on a spring-cart, in order to carry the ladders also. The ladders are very useful in the case of the hose. I am sure if we had a reel I could reach a fire in a quarter of the time that it now requires with the engine."

The spring-cart referred to under the term "hose reel" is now obtained, and has abundantly answered the expectations expressed, as I have ascertained by the following experiment. Arriving in Preston one day at 11 o'clock, I proceeded immediately to a factory distant 1100 yards from the fire-office, to which place an alarm of fire was sent by one of the town officers. In 15 minutes after the dispatch of the messenger, the spring-cart drawn by a horse, was, with ten firemen, at the seat of the supposed fire; in two minutes\* more the hose was unwound, attached to the plug, and the water thrown up to the highest story of the factory; in another minute, a second was in full play; and in a short time a third: the height to which the water was thrown, was not visibly altered by the three openings. One man was sufficient to manage each hose, so that the rest of the firemen were available for any contingencies which might arise. It is a vulgar error to suppose that the calls for water during the day diminishes so materially the pressure as to render it unavailable for the extinction of fire without the use of an engine. Experiments instituted at my suggestion, to ascertain the force of this objection (*First Rep.*, Vol. II. p. 149), show that the actual difference of height to which water can be thrown by means of the hose, is about four feet in favour of the night. Similar results follow from the experiments made on the mains and services of the Southwark Water-works Company, recited in (*Vol. II.* p. 66) Mr. Hawksley's evidence. The experience at Preston shows that the fears of a failing supply or diminished force, by the use of several jets at the same time, are quite unfounded. At present in that town, the only obstacle to the employment of a sufficient number of jets, is the distance of the plugs from one another, as shown in the following evidence of the manager of the water-works—

"At what distance are the fire-plugs from each other?—Where we have mains, every 100 yards throughout the whole town.

"Is the distance of 100 yards sufficient?—The distance is too great to be of service to every house; they should only be 50 yards distant.

"According to your rate of 2*l.* per plug (in other towns 1*l.*), supposing them to be placed at intervals of 50 yards, making each house not farther distant than 25 yards, the original cost to each house would not be above 4*s.* or about 5*d.* annual charge on each house, for the security and protection against losses by fire?—That is the correct way of viewing the question."

Now for 2*l.* plugs can be fitted up, so as to screw on two hoses to each, and thus to furnish two jets; or in other words, for the sum of

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\* Short as this time was, the experiment was unfair to the fire brigade, for to avoid an alarm to the town, the firemen were summoned by messengers sent from the fire-office to their places of work, instead of by the fire-bell.

5*d.* per annum, each house in the town may be supplied with arrangements for the extinction of fire, equivalent to four fire engines constantly kept at its door for its exclusive use. The experience at Oldham amply confirms that at Preston. Mr. Emmott, the manager and engineer of the Oldham Water-works, describes the practice in that town in relation to fires—

“In five cases out of six, the hose is pushed into a water-plug, and the water thrown upon a building on fire, for the average pressure of water in this town is 146 feet; by this means our fires are generally extinguished, even before the heavy engine arrives at the spot. The hose is much preferred to the engine, on account of the speed with which it is applied, and the readiness with which it is used, for one man can manage a hose, and throw as much water on the building on fire, as an engine worked by many men. On this account we very rarely indeed use the engines, as they possess no advantage whatever over the hose.”

The manufacturers in Preston have seen, and availed themselves of the advantage of having water on the high pressure or natural system. Several of them have water laid on in every story of their factories, with plugs attached, and hose in constant readiness to be applied in case of fire. The watchman of the mill can screw on the hose, and apply the water without assistance, and in several instances this functionary has been able to extinguish fires, which but for the prompt means at hand, would have caused serious damage, if not the destruction of the mill. So much confidence has this increased security given to the owners of mills, that both in Preston and in Oldham, they have in various instances ceased to insure their property; and this increased safety is purchased at a small price, as Mr. Anderton shows.

“What is the expense of fitting up a warehouse with plugs in each story?—About 25*l.* to 30*l.* for a warehouse of five stories. We charge a guinea annually for the privilege; so that the total annual cost is about two guineas.

“It is stated, that the insurance even of the smallest class of warehouses amounts to 20*l.*, and many to 50*l.* or 600*l.*; so that for 2*l.* they receive so much additional security, that some of the proprietors of such property have thought of discontinuing, and some have actually discontinued their insurance?—That is the fact.”

In Oldham, the same evidence is given as to increased security and diminished risk to mills and warehouse property by the adoption of the natural system, as shown in another part of Mr. Emmott's evidence:—

“Are there mills and warehouses fitted up with plugs and hose in each story?—There are, and since the raising of the insurance premiums, this plan has increased. There is one mill-owner, who has water laid on into every room, the pipe terminates in a transverse tube, at both ends of which there are hollow iron cylinders perforated with holes, and capable, when the water is turned on, of throwing the water with great force, and deluging every part of the room. The pipes are so arranged that the watchman at the bottom of the outside wall of the building, by simply turning a cock, can throw an unlimited quantity of water into every corner and crevice of the room on fire. I am sure the water will do more damage than fire could possibly do to the contents of these rooms, if any of them should ever take fire.

“What was the cost of making this arrangement, and what do you charge



him for the privilege of having water?—The original cost was about 150*l.* or 200*l.*, and we charge 4*l.* per annum for water.

“Does he insure his mill now?—He formerly did, I believe, to the extent of 200*l.* per annum, but since the introduction of this arrangement, he feels so secure that I understand he has ceased altogether his insurance.

“You stated that the original cost of fitting up this mill of five stories was about 150*l.*, and that your charges were 4*l.* per annum, so that for an annual charge of 14*l.*, he has obtained as much security against losses by fire as he did by the annual payment of 200*l.*?—Exactly so.

“In the other cases of mills with plugs in each story, and hose in constant readiness, have their owners also ceased to insure their buildings?—Not altogether, but they insure their property for much less than formerly, considering the increased security as a sufficient guarantee against much loss in case of fire.”

This method of securing premises against fire presents many advantages (independent of being only about one-fourth the expense) over the old plan of having a large cistern filled with water at the top of the factories; or even over the more common system of having numerous plugs around the building. The plugs being kept in each story, the water can be thrown to a greater height, and with more force, on account of the diminished resistance of the atmosphere, and decreased friction, which, under ordinary circumstances, prevents the water rising to more than one-half of its natural pressure; and as they are not liable to be out of repair, they do not present the same risk of failure as the water tanks, which from neglect or accident are very frequently found unavailable, as strikingly instanced in the case of the great fire at the Tower of London. The experience at Preston and Oldham amply confirms that of Philadelphia and New York, as to the practicability and advantage of using hose instead of fire-engines in case of fire.

53. In Philadelphia it is the custom to wash the fronts of the houses and the windows by means of the hose, and this, in an architectural point of view, is of no small importance; as it may also be conjoined with the practice of the men employed to use the hose. In Oldham, according to Mr. Emmott's evidence:—

“The mill-owners, who keep hose, use it once a month, under the inspection of our surveyor, to wash their windows, and the fronts of their factories, and our man then sees whether it is kept in good working order.

“Is it customary to wash windows and fronts of houses in this town by means of the hose?—Not so much so as is desirable, but it is done. Our town-hall, a stone-faced building, is washed once every month, and looks fair and clean amidst the surrounding blackness.”

With regard to our public buildings, and even of our private houses, this custom, attended with an expense altogether trivial, ought certainly to be encouraged, for by accustoming the eye to cleanliness, and encouraging habits of neatness and taste, a decided step will be made in the improvement of the social and sanatory condition of our population.

54. The advantages offered by the natural system of supplying water are not sufficiently known. I feel fully persuaded, that the application of water from the hose to the cleansing of pavements, and watering the streets, as in actual daily operation at Philadelphia, would be useful and economical. Unfortunately, the paved streets, or the absorbent surface of the macadamised road, are not suited to the universal extension of the principle. By an experiment made at my request, by Mr. Park, of

Preston, on a very inconvenient boulder stone pavement, and with all the disadvantages of a first experiment, the cost of scavenging very effectually 1000 square yards amounted to 4s.\* According to the experience of the Manchester scavenging department, as given in Mr. Whitworth's evidence, (First Rep., Vol. II. p. 396), the average expense of scavenging and carting away the refuse of 1000 square yards is 4s. 6d., or an additional 6d., for work not nearly so efficiently executed. According to the evidence of Mr. Park, two men, with a little practice, would be quite sufficient to manage the hose, instead of the four men employed by him in the experiment; and as the price of water would be materially reduced if the demand for scavenging in this manner became general, and as practice would show how to economise its use, he is clearly of opinion, that 2s. per 1000 yards, or half the price obtained in the experimental result, would be amply sufficient to cover the expense of the application on a large scale, and on a suitable road. That it would be very economical as regards the health of the community, even were its price two-fold, none can doubt who see the beneficial effects of a heavy shower of rain in sweeping into the sewers the garbage and refuse, which, in the present defective mode of scavenging, are allowed to lie and rot on the surface of streets in the poorer districts. Before the introduction of this method, however, an improvement must be adopted, in making non-absorbent streets and roads, the commencement of which is seen in the coal-tar pavements, introduced in Nottingham and other towns for 1s. per square yard, or about one-third of the present cost for streets of a very inferior description. The value of scavenging by water, with regard to the application of refuse for productive use, I shall have occasion to point out in another part of my report.

55. The advantages of the natural over the intermittent supply of water for domestic purposes are so obvious as not to require comment. A never failing and unlimited flow direct from the main, not liable, as in the case of collected water, to acquire a temperature unpleasantly high, and secured from the absorption of vitiated air and unpleasant effluvia, to hasten the decomposition of the small amount of organic matter generally existing in water, offers obvious and important advantages. The necessity for the collection in vessels of a sufficient size, or the substitute of a costly tank, subject to dilapidation, and taking up as it does much space in the already too small dwelling of the working man, in addition to the other evils attendant on the intermittent system, and already described § 50, all conduce to the sparing use of

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\* The following are the details of the experiment:—

1. Fishergate.—Water used, 36 gallons per minute, with the small rose on the hose; time expended, 13 minutes; street cleaned, 26 yards  $\times$  8 yards = 208 square yards;  $13 \times 36 = 438$  gallons consumed, value 4d.

2. Lune Street.—Water used, 90 gallons per minute, with large rose on hose; street cleansed, 25 yards  $\times$  10 yards = 250 square yards; time, 11 minutes.

$11 \times 90 = 990$  gallons consumed, value 9d. The expense of 1000 square yards would be

Water . . . . .	3s.
Labour . . . . .	1s.
Wear and Tear . . . . .	?
<hr/>	
Total . . . . .	4s.



water, and act detrimentally both on the physical and moral condition of the poor. There ought to be no limit put to the supply of water for domestic purposes; but, on the contrary, every facility should be afforded for its unsparing use. I have spent many days in visiting the houses of artisans in towns both well and ill supplied with water; and I can state, as an invariable rule, that there is a marked difference both in the moral tone and in the physical condition of the inhabitants of those towns; and this difference is even perceptible, though in a less degree, in the houses of the same town, according as they are or are not freely supplied with water. In Bristol, where there is no water company, and no supply, except from pumps and wells, the dwellings of the lower classes are generally abominably filthy, full of vermin, and in a condition such as I have not seen in any of the large towns of Lancashire. If, then, the unstinted and constant supply of water be essential to cleanliness, and indirectly to a healthy tone of society among the lower orders, as few will be inclined either to dispute or to deny, it becomes an important question, how the benefits of this essential necessary of life can be best extended to every person in a community. Of course the best means are the most economical, for wherever much expense must be incurred in an improvement, many obstacles are immediately presented to its execution. Now here the advantages of the natural system are very obvious; for, instead of having to provide tanks at an average expense of 2*l.* to each cottage, and a communication-pipe, generally at a cost of 1*l.* more,—by the natural system, and by a few judicious improvements on it, the total expense never amounts to one-sixth this sum, and is generally considerably less. In Preston, the average cost per tenement is from 5*s.* 6*d.* to 6*s.*, and in Oldham it is 7*s.* In fact, the exorbitant charges which usually have to be incurred on the old system materially impede the extension of water-works; and, on the contrary, everything which tends to decrease the charge, serves to increase the number of tenants to the water companies, as shown both by Mr. Emmott, of Oldham, and Mr. Anderton, of Preston. The former witness is engineer and manager of the gas as well as of the water-works, and has, therefore, double experience on this point.

“We found the plumbers’ charges so enormous, that they prevented the accession of new tenants to the Company, so that we took the fitting up into our own hands, and reduced the price so much, that where they charged 4*s.*, we only charged 1*s.* 6*d.*; and the consequence was, that we found our tenants increase much more rapidly than before. We still allow the plumbers to make the fittings, if preferred by the tenant, but they are now obliged to come down to our price.”

Exactly the same evidence is given by Mr. Anderton:—

“You state that you do not employ plumbers; do you refer to the interior fitting of a house as well as to the exterior?—Yes, we do the whole work ourselves. We found that the plumbers did not do this work uniformly, and charged high; and as it is important to have their work well done, when the water is at high pressure, we took the whole into our own hands.

“By this arrangement, the charge of water into a house is materially diminished?—Very materially so, at least 20 per cent. As we do not make a profit upon our fittings we can let our tenants have them at prime cost.

“This also has contributed to the rapid increase of the number of your tenants?—Without doubt it has.”

56. That the cheap method of laying on water has conduced to the more extensive use of it is attested by various landlords; Mr. Smith, a cottage-owner in Preston, says:—

“ I have about 80 or 90 cottages, besides other property.

“ Are these cottages generally inhabited by the poorer classes?—By labourers and their families. They pay from 2s. to 2s. 3d. per week; but this frees them from all other charges for taxes and water.

“ There is water introduced into all the houses?—Yes, into every house. I have contracted with the waterworks company at the rate of 5s. 6d. per cottage, whether occupied or not. I do not charge any separate rent for it, as I consider that I am paid by the increased demand for my houses.

“ Since you introduced water into your houses have they let better?—Yes, very much better. I formerly had 40 or 50 houses empty; now I have not more than one. Perhaps this is not altogether due to the water; but that I am sure is the great inducement. I have not increased the rent since I took in water; they agreed to pay me 2d. per week more for the advantage of the water; but I have never charged that sum, as I find the increased demand pays me.

“ If you had been obliged to use water-tanks or cisterns to each house, with the usual appurtenances of balls and cocks, would you have ventured on the speculation of supplying each house?—Most unquestionably not; it would never have paid me; I could not have thought of it; the original outlay to myself would have been considerable, and my tenants could not easily have remunerated me for the outlay.

“ Then it was because the water is constantly on in the pipes, and therefore the small expense of laying it on, that induced you to supply your houses with water?—It was indeed, and the convenience to my tenants.

“ Have you any neighbouring cottage-owners who have not laid on water to their houses?—There is one close by: the consequence was, that many of his tenants left him and came over to me immediately that I laid on water, although his houses are rather better than mine in other respects.

“ Have you noticed any difference in the cleanliness of your tenants?—I have no doubt of it; but I cannot be positive, as I do not go much amongst them. I have seen, however, when they came to me, that their persons are much more cleanly.”

Mr. Ashton, of Hyde, near Manchester, a well-known and extensive manufacturer, has given similar evidence (First Rep., Vol. II. p. 99). He states that, although the water, which he has laid on to all his cottages, even to the poorest, costs for each 3d. per week, or thrice as much as it costs at Nottingham, and twice as much as at Preston, still that all the cottagers hailed its accession with joy, and willingly pay the amount for the benefit conferred. In fact, there is much concurrent evidence to prove that there is no boon more highly prized by the poor than an unstinted supply of water, and that there is no necessary for which they would more willingly pay a fair and adequate price. The evidence of Mr. Thomas Sumner, an intelligent collector of water-rents in Preston, may be cited:—

“ Do you find much difficulty in procuring the water-rents from cottage property?—No, they come in pretty well, according to the times; generally speaking, we have not much trouble. Cottage inmates are particularly well pleased to have water laid on into their houses, and do not seem to have any objection to pay for it. Those who have been accustomed to the supply of water find the benefit of it so great that they will not live in cottages where it is not laid on, and they value it so highly that a threat to cut off their



supply causes a speedy payment of the arrears. On this account we have very little loss in the collection.

“Do you know exactly the amount of loss; does it exceed three per cent.?—I cannot say precisely, but I believe it is much under three per cent.

“From your experience, as a collector, are you of opinion, that if the Legislature compelled water to be laid on to each cottage, that the inmates would object to the additional rental thus occasioned?—I believe that they would not; indeed I am sure that they would be very willing to pay the additional rent.”

It has been stated in evidence, that it would be impracticable to lay on water into the houses of the poor; for if a leaden pipe were introduced, “it would be there in the evening, but would be gone in the morning.” This general charge of theft I find unwarranted by actual experience. In Preston and Oldham there are no stand-pipes, the water being always laid on in the houses; and in the former town the pipes are unnecessarily exposed; and yet in the experience of 10 years only two cases of theft have occurred, to the total amount of 15s., and one of these was in an unoccupied house. In Oldham, with an experience of 17 years, the manager never heard of one case of theft. Thefts of this kind, if at all to be feared, are much more likely to occur on the intermittent than on the continuous system, for the water acts as its own police, and betrays, while it drenches, the thief.

57. In considering the best means for the extension of this benefit to the working-classes, or in sanctioning the formation of new water-works, it would be highly advisable to obtain evidence as to the quality of the water, particularly with regard to its hardness. (Evidence of Dr. Clark, First Rep. fol., Q. 104.)

The value of attention to this point will be obvious, when the difference of consumption of soap is considered. I found by various trials in summer, that the Manchester water possesses a hardness equivalent to what would be obtained if 13 or 14 grains of chalk were dissolved in a gallon of pure water.

Now, in Aberdeen, the hardness of water is only 1 degree—*i. e.* equal to 1 grain of chalk per gallon; and, in some towns in Lancashire, not more than 4 degrees. The annual consumption of soap in Great Britain is  $7\frac{1}{2}$  lbs. per head of the population, which at 50s. per cwt. is an expense for soap of 3s. 4d. incurred annually by each person. As the consumption of soap increases according to the hardness of the water, we may fairly estimate the annual consumption for each person in Manchester, the water of which is 14 degrees, at 15 lbs., or the same as that of London, the water of which place has 12 degrees. Thus the hard water of Manchester may be regarded as increasing the water rent to a family of five individuals, 16s. 8d. per annum, or 49,363l. per annum to the whole town, a sum nearly double that of the present gross water rental. But large as is the cost entailed upon a town by a bad selection of water, in the unnecessary consumption of soap, still greater loss is incurred in the wear and tear of clothes. Whilst, therefore, the nominal price charged for water in a town may appear tolerably low, the hard quality of the water itself may involve a very inconsiderable additional expense.

It is also extremely important to have a clear filtered water for domestic use, instead of the dirty water, generally abounding with visible animalcules, which is too often met with throughout the whole country,

and in Lancashire as well as in other parts. Those who are acquainted with the habits of the poor know well how easily they are induced to leave the natural beverage and resort to stimulating drinks; and a powerful incentive to this is the disgusting appearance of the water as it issues from the main. I have already forwarded to you, in the examination of Mr. John Graham, partner in the extensive print-works of Messrs. Hoyle and Sons, evidence as to their experience in filtering water (First Rep. fol., App. p. 170). He there states, that for 156*l.* per annum, (exclusive of the rent of land,) half a million of gallons daily may be filtered, or 182½ million of gallons per annum. This estimate is for filtration by the “Lancashire method,” a very efficient and economical system; and by its adoption every labourer’s tenement, assuming his consumption at 40 gallons daily, could have his water perfectly clear and filtered for 3*d.* additional to his annual rental, a sum which would willingly be paid. One public filter must be infinitely more economical than 20,000 private filters, as Mr. Hawksley says, “with 20,000 different cares, cleansings, and renewals.”

58. I have stated the advantages derived from the natural system, or system of continuous supply, at high pressure, but I have not yet alluded to the objections urged against the general adoption of the system, and the validity of them, as tested by experience in this county. The only objections which I have heard are those brought by Mr. Wicksteed before your Board (First Rep., Vol. II. p. 16). These I apprehend to be: (1.) The necessity for *larger and stronger* mains than on the intermittent system, and the fear that they will be destroyed sooner. (2.) The necessity for a larger number of officers to prevent “waste of water.” (3.) A supposition that the water would be drawn off at different parts of the town, and not concentrated at a place where fire might happen. These being the only objections to the system, I have endeavoured to ascertain their validity, by the experience of those towns which possess a continuous supply. As to the first objection, that a stronger and larger main is necessary, actual fact and experience finds the reverse to be the case. Thus the manager of the Preston water-works is asked—

“Does this pressure (160 feet) render it necessary to have larger and stronger mains and service-pipes than those used where the water is not kept at high pressure?—Quite the contrary, because the water being constantly on, and not coming at intervals, a smaller pipe is sufficient for delivery, and the pipes are not strained by a sudden gush of water. We never had a pipe which burst from the pressure of the water, but we test them beforehand to bear the pressure of 300 feet.”

The evidence of the manager of the Oldham water-works is still more satisfactory, because in dry summers he *districts* the water to some of the poorer parts of the town, having it on five hours in the day, or on the intermittent instead of the continuous system. He is, therefore, in a position to give correct information as to both systems:

“Your pressure being 300 feet, do you find it necessary to use stronger pipes on the system of continued supply than on the intermittent method?—Quite the reverse; the pipes last longer on the continued than on the intermittent system, as we find by experience in those places where we *district* our water. When they are emptied, and again filled, we find that they corrode very fast, much oxide of iron accumulates in them. They require to



be stronger, also, to stand the sudden gush of water, for we find that they often burst by compressing the air, which must find a vent-hole."

The second objection, that a larger number of officers is requisite to prevent waste of water, is equally untenable, as shown at Preston:—

"It has been stated, that a constant supply of water in the pipes subjects companies to a considerable waste; do you find by your experience that this is really the case?—Quite the contrary; I think the constant supply is a means of saving water. We very seldom indeed receive any complaints of an unnecessary waste of water, and our men are very active in searching out grievances of this kind. The fact is, our high pressure would render a running tap a great nuisance, from the noise it makes. Our actual consumption here is 76 gallons per house, but this includes all the large consumers, of which we have a great many in mills and railways. The average consumption in tenements of the labouring class is about 45 gallons daily.

"How many turncocks do you employ?—Only one; he is sufficient for all purposes."

All the cocks and valves in Oldham also are managed by one man, who is found quite sufficient. The manager states, that if he had much to do with the intermittent system he would require three or more. He is quite decided as to the relative economy of the two systems:—

"Now you have stated that you are not sure that you make any saving by districting your water when it is scarce, except that it may prevent theft; suppose all the houses in the town had water laid on, would you still district it?—No, certainly not; in fact I know very little about districting, as you will well believe, when we keep only one turncock. It is only in those districts where we think there is theft by one neighbour giving to another.

"From your experience of the two systems, which would you think the most economical to yourselves, supposing that all the houses took on water?—I have not the slightest doubt as to the superior economy of the system of continued supply."

TABLE showing the OPERATION and MANNER of SUPPLY of certain WATER COMPANIES in the under-mentioned Towns.

Towns.	Number of Houses according to Census of 1841.	Number of Houses or Tenants supplied.	Cost of Supply to the lowest Class of Cottage.	Capacity of Reservoir, in Gallons.	Height of Surface of Water in Reservoir above the highest part of the Town.	Height of Surface of Water in Reservoir above the lowest part of the Town.	Length of iron Mains.	Length of Leaden Service Pipes.	Is the Water always on in the Mains?	If not, how often is there Service?
Liverpool. { Harrington	44,326	28,758	{ 5 per cent. on rental. }	..	0 {	Feet. Under-ground.	{ 120	..	No.	{ 3 days per week 2 hours.
{ Bootle . . .		..								
Manchester and Salford	57,238	30,000	5s. {	2,000,000	0	155; 122	80	170	No.	{ 1 hour to 4 hours daily.
Preston . . .	9,984	5,026	7s.	50,000,000	36	160	11½	..	Yes.	..
Bury. . . . .	5,260	2,980	12s.	4,181,760	50	130	5	..	Yes.	..
Ashton . . .	4,700	4,000	6s.	100,000,000	200	260 {	Un-known	..	Yes.	..
Rochdale . .	8,266	2,800	10s.	22,781,253	6	96	8½	8½	Yes.	..
Oldham . . .	8,220	5,620	12s.	85,000,000	30	300	25½	25	Yes.	..

Note.—Probably in answering the question as to the number of houses supplied, the Companies refer to tenants, two or three of whom may be in one house, if let off in flats. The returns in the cases of Manchester and Liverpool refer to houses supplied by stand-pipes, as well as those into which water is led. No comparison can be made of the capacity of reservoirs in Liverpool with those in other towns, for in the latter they are impounding reservoirs, in the former water is pumped in by steam-engines.

I have already stated (§ 52), and shown by experiment, that the objection as to the diminution of pressure during the day, rendering the water unavailing in case of fire, is founded on an erroneous hypothesis.

59. Having considered the supply of water on the two systems, I have subjoined in a tabular form the statistics of the towns supplied, and these will be a sufficient answer to theoretical objectors as to the impracticability of bringing a supply at high pressure from a distance of several miles, owing to friction in the pipes. In the case of Preston and Oldham, the distance of the reservoirs from the extreme point of the mains is about four miles; in the case of Ashton, above three miles. Manchester, Preston, and Oldham are constructing new reservoirs, to increase their supply of water. It is necessary to remark, that the explanation in the appended note applies probably to Manchester, and certainly to Liverpool. With respect to the other towns, the returns refer to the actual number of houses into which the water is laid on.

#### LOCAL ACTS AND USAGES.

60. Various Local Acts, several of them with direct reference to sanatory improvement, have of late years been sanctioned by Parliament. I propose in the present section to describe generally their tenor and powers, in compliance with the terms of her Majesty's commission, in which we are directed to describe "the operation of the laws and regulations now in force and the usages at present prevailing with regard to"—(1), the drainage of large towns; (2), the regulation of buildings; (3), the improvement in towns; and (4), the supply of water.

61. The powers granted by Parliament for the drainage of towns seem to be founded principally upon the statute of 23 Henry VIII. c. 5, and generally follow closely the provisions granted in that Act, varying occasionally in the manner of reimbursing the cost of improvement, and defining more clearly the powers for making new sewers. The words of the preamble of the original Act describe accurately the evils existing at the present day in many of our large towns and populous districts:—

"Our Sovereign Lord the King, like a virtuous and most gracious Prince, nothing earthly so highly weighing as the advancing of the common profit, wealth, and commodity of this realm, considering the daily great damages and losses which have happened in many and divers parts of this his said realm, as well by the reason of the outrageous flowing surges and course of the sea in and upon marsh grounds and other low places heretofore, through politic wisdom, won and made profitable for the great commonwealth of this realm, as also by occasion of land waters, and other outrageous springs, in and upon meadows, pastures, and other low grounds adjoining to rivers, floods, and other watercourses; and over that, by and through mills, mill-dams, weirs, fishgarths, kedels, gores, gotes, floodgates, locks, and other impediments in and upon the same rivers and other watercourses, to the inestimable damages of the common wealth of this realm, which daily is likely more and more to increase, unless speedy redress and remedy be in this behalf shortly provided: wherein albeit, that divers and many provisions have been before this time made and ordained, yet none of them are sufficient remedy for reformation of the premises, hath therefore by deliberate advice and assent of his Lords Spiritual and Temporal, and also his



loving Commons, in this present Parliament assembled, ordained, established, and enacted—

“That Commissioners of Sewers and other the premises shall be directed in all parts within this realm from time to time.”

The commission under this Act was directed to “indifferent and substantial persons,” possessing lands and tenements within the limits of the jurisdiction, and therefore included a similar class to those now acting under the amended powers, and eligible on account of being rated to a certain amount for the support of the poor.

62. In one point the present commissions possess less powers than those granted by the Act of Henry VIII. The obstructions to rivers and streams by weirs and dams thrown across their courses are now as frequent and hurtful as they were in 1531, when they produced “outrageous springs and land waters,”—to the “inestimable damage of the commonwealth of this realm.” Yet the wise provisions for their suppression and prevention in the Act recited have been lost sight of in the powers recently granted by Parliament; and the Sewerage Acts now in operation in Lancashire no longer give the power “further to reform, amend, prostrate and overthrow all such streams, ponds, locks, fishgarths, hebbing-weirs, and other impediments and annoyances aforesaid, as shall be found by inquisition, or by your surveyings and discretions to be excessive and hurtfull.”

The consequence of the suppression of this power has been, that the streams which convey the sewerage of Manchester and other towns are everywhere obstructed, causing those evils which are alluded to in sections 6 and 7.

63. Before proceeding to an examination of the powers granted by local Acts I would refer to their want of consolidation and inconvenient distribution to distinct and sometimes to opposing authorities. For example, the paving and sewerage of the *STREETS* of Liverpool are intrusted to commissioners, nine of whom are members of the corporation, while 15 are independent of that body; the drainage and paving of *COURTS* and *ALLEYS*, on the other hand, are severed from the authority exercising jurisdiction over the streets, and are intrusted to a committee of the corporation appointed under the Act. Then the street *cleansing* is quite apart from either of these authorities, being placed under another and distinct committee of the corporation, and possessing no connexion with the commissioners of sewers, although the legitimate object of the works executed by the latter is to preserve cleanliness in streets and in the houses adjoining; while, with strange incongruity, the “watering of streets,” which is essentially connected with their proper cleansing, is removed from the scavenging authority and placed under that of the Commissioners of Sewers.

But this is not all; for the sewerage and cleansing of the borough is subdivided, part of it (Toxteth Park) being governed by distinct Commissioners, quite independent of the authorities in the parochial part of Liverpool, as far, at least, as regards the paving and sewerage of streets.

Equal inconsistency and want of consolidation is exhibited in the Acts for supplying Liverpool with water. There are two water companies, with two distinct capitals, with the expenses of two distinct managements, having mains laid down in the same streets, and supply-

ing the same district with water. The supposed or actual insufficiency of these companies compels the formation of a third establishment with new mains and service-pipes, for the sole purpose of extinguishing fires and supplying water for public purposes; and the new works having the former object expressly in view, is inconsistently severed from the body possessing jurisdiction over the fire-police. There is one fortuitous advantage conferred by this new Act, if it be properly appreciated, viz., that the Commissioners of Sewers are enabled to purify the sewers, by using the water, and thus prevent the formation of those emanations at present so much complained of. For instance, Mr. Roe, the engineer of the Holborn and Finsbury divisions of sewers, is asked—

“ Is it consistent with your experience that a district where the houses have badly-constructed drains with insufficient supplies of water is nearly in as bad a condition as a district having only cesspools?—Drains of this description are, in fact, a series of widely-spread cesspools giving off emanations, and often requiring cleansing.”

All the evidence taken on the point shows that new drains made without reference to their frequent “flushing” do act as extended cesspools.

To sum up these grievous instances of ill-considered legislation and want of consolidation, which have led to so much confusion and evil, I subjoin, in the following Table, a view of the manner in which the various authorities appointed by the local Acts clash with each other, and prevent the progress of improvement, as instanced in the recent Acts, 5 Vic. c. 44; and 6 & 7 Vic. c. 109, and those already cited.

TABLE showing the want of Consolidation and inconsistent powers of the various authorities appointed under the Local Acts for Liverpool, previously cited.

Corporation.			
1 Health Committee.		2 Cleansing Committee.	3 Fire Committee.
Does not include the management of cleansing or sewerage streets, but interferes with authority No. 5 in paving and sewerage courts. Does not possess the natural connexion between authorities 2, 5, 6.		Has no connexion with sewerage or with watering the streets, and therefore is ineffective by interfering with, and being interfered by, authorities 1, 4, 5, 6.	Possesses charge over fire-police, and yet has no charge over the water, brought in at an immense expense for the extinction of fire. Is dependent, therefore, upon 4, a distinct and independent authority.
Commissioners of Sewers.		Two Water Companies.	
4 Water Department.		6	Toxteth Park Commissioners. 7
Sewerage and Paving.			
Water brought into the town for extinction of fire and watering the streets; interferes, therefore, with authorities 2 and 3, and, if applied to public fountains, with duties of 1.		Opposed both to each other, compelling from their supposed inefficiency, the formation of a new establishment (4) for the extinction of fire; and, from the inadequacy of domestic supply, preventing the proper action of sewers, and hence interfering with authorities 1, 2, 3, 5, 7.	Causes the expense of separate management for various offices which might be comprised under one or more of the previous authorities, by an extension of the existing natural area.



Similar instances of a want of consolidation and of uncombined execution exist in all towns, more or less, and it is scarcely necessary to describe them in detail. In Manchester, for example, a committee of the corporation possess powers to execute new paving, but the charge of its maintenance devolves upon a distinct body—the Surveyors of Highways. The Legislature originally granted powers of sewerage to various authorities within the same natural bounds; thus, Manchester Proper, Salford, Ardwick, Chorlton, &c., had distinct and separate jurisdiction over the sewerage of their respective districts, all comprised within one natural area; and even now, although, with the exception of Salford, the powers possessed by these authorities are transferred to the corporation, they are managed by distinct and independent committees, who are ignorant of, and therefore do not derive any immediate benefit from, the experience obtained by the others. In this town, also, we find separate committees for cleansing, and for sewerage and paving, although the general improvement of the street, and the natural connexion between the three operations render their union very desirable; and it will be observed that this useless and unnecessary division of labour (First Rep., Vol. II. pp. 82–324, 339) entails the expenses of separate management, besides rendering it impossible to obtain properly qualified officers, men of science and education. It has the *primâ facie* appearance of simplification, and of a division of labour to proceed by different bills and separate measures; whereas, as appears by the examination of the working of such separate measures as are in actual operation, the effect is the very reverse; separating works which can only be carried out, economically and efficiently, by unity of design and management—multiplying independent and inefficient officers with clashing duties—increasing the expense of management, and at the same time the difficulty of obtaining an able and conscientious discharge of duty by officers having no private practice and interests to serve.

In the evidence given in your first Report, this division of labour, even in the Metropolis, is complained of as injurious, and as leading to serious evils. If, then, the consolidation and combination, rather than separation, of administrative service be the true course of economy and efficiency even in the Metropolis, it would seem to be so *à fortiori* in the provincial towns, where officers properly qualified, and giving their whole time to their duties, cannot be obtained for the salaries afforded.

That this consolidation is highly necessary in Lancashire, there can be little question; but it will appear still more apparent if we consider the probable effects of any measure extending the powers of the existing jurisdiction. At present, the custom is to pay the surveyors of new improvements either by salary or by fees, which, according to the information of witnesses acquainted with the subject, would be, for first-rate houses, 3*l.* 10*s.*; second-rate, 3*l.*; third-rate, 2*l.* 10*s.*; fourth-rate, 2*l.*; and for all alterations half that sum. Now, at the present rate of increase of the population in Great Britain, (230,000 per annum,) requiring 59,000 new houses annually for their accommodation; if only half these, instead, probably, of two-thirds, came within these extended jurisdictions, and the average were taken only as fourth-class houses, the expense to which the country would be exposed is 50,000*l.* per

annum for a defective machinery of private practitioners. But in addition to these surveyors, the various authorities are also enabled to appoint clerks, collectors, and other officers, without any securities as to skill or qualifications. If, however, a consolidation were effected, the expense of one properly qualified officer, made independent of private practice, would be much less than the present cost of numerous ill-qualified officers, fettered by the clashing interests of private practice; and to one qualified officer, all the engineering duties of a town would be easy of execution. Thus, the maintenance of the width of streets, the prevention of encroachments, and other similar duties, would be connected with the principal service of the drainage regulations and the supply of water.

At present the case stands actually thus: that in the majority of towns in Lancashire possessing local Acts, there is an expensive and inadequate supply of water by a trading company; in all the towns an expensive and imperfect drainage of districts, parochial or intra-mural, under one management; a separate drainage and paving of adjoining districts, extra-parochial or extra-mural, under another management; and an expensive and utterly imperfect system of scavenging main streets, to the neglect of courts and alleys, under another authority;—making at least four separate managements, where one would suffice and act far more economically as well as efficiently.

64. After the ample details, which I have already given, on the sewerage of the towns under examination, I need only refer to the obvious defects of the Acts empowering its execution. It is quite unnecessary to allude to the glaring imperfections and inadequacy of powers granted by the old Highway Acts, under which several of these towns are placed. The more recent Acts are also very improperly framed; sometimes conferring excessive powers on bodies practically irresponsible, and, in other instances, restraining proper execution by a deficiency of power.

As an instance of excessive powers, I would refer to what I have already said in paragraphs 8, 14, 15, as to the practice now in operation under the local Acts for Manchester, Salford, and Little Bolton. Powers are given in them to sewer, pave, and otherwise to improve property, the cost of such improvement to be *immediately* levied upon the *owner or occupier* (unless under certain circumstances, such as when the cost of improvement is greater than the rental). This power, as already shown, produces very distressing results; and it may be adopted as a general practical rule, that no cottage-owner has funds at his disposal available for any costly improvement, or in fact for any purpose not in the usual course of his pursuits. The distraining for rent, therefore, disturbs his means of livelihood, and is a powerful obstacle to the progress of improvement. It is also generally the case in the towns of Lancashire, that the owner, or, as defined by the Acts, “the person in the receipt of rent or profits of houses and lands,” has rarely the fee-simple, or even an unincumbered life-interest of the property. In some districts, the property is often held by lessees, and frequently under such complex ownership, that Mr. Wroe states there is sometimes great difficulty in discovering the actual owner or lessee. In Manchester, it is stated in evidence that the lower class of cottages change their owners, or “rent receivers,” every ten years. To charge the lessee, or the person in



receipt of rents, who may be within two or three years of the expiration of his lease, with the cost of improvement, which not unfrequently amounts to more than the annual rental, is in fact to confiscate his property. Nor is it often possible to define the owner "of improved rents" in such manner as to prevent injustice to the direct receivers of rents under the present complicated system. "I have cases brought before me," says Mr. Rushton, the stipendiary magistrate for Liverpool, "where a man has given his property to be divided amongst his married daughters, to be equally divided amongst their children; cases in which the respective shares in their property could only be ascertained after an expensive chancery suit! How can a magistrate be expected to do this summarily?"

65. These circumstances render the present system extremely unjust and oppressive in many cases. The distribution of charges for improvement under a competent authority, a system unanimously recognised by eminent practical men, such as those whose evidence I have already brought forward, would obviate all these evils. And at the same time that the repayment of the cost of improvement is distributed over a term of years, it should be provided as obviously just, that for every improvement made subsequent to the lease or occupation, and not set forth or implied in the original agreement, the owner is entitled to remuneration. The distribution of the charges over a term of years co-equal with the probable duration of the improvement ought, therefore, to be borne by the *occupier*, and the expense charged upon him and not upon the owner. This would remove the great obstacles to such improvements as the evils which I have brought before your notice obviously suggest. The charge distributed over a period coincident with the benefit derived, ought certainly to be defrayed by the person enjoying the benefit, except in the case of weekly or monthly occupiers, when, to prevent the expenses of frequent collections, such charge might be made on the owner, who is now to be looked upon in the light of a collector of rents, and, if need be, to receive a per centage for the additional trouble. I have previously pointed out the necessity for establishing the system of making the new improvements on special instead of on general rates, § 18; and it is unnecessary in this place again to contrast the operation of the two systems.

66. The present sewerage Acts in operation in Lancashire, in all cases possess an extensive and undefined power, in enabling them to compel the structure of house-drains in such general terms as "to the satisfaction of the commissioners;" while at the same time the Acts are defective in not providing for a *proper* connexion of house with street drainage.

The delegation of power to any local authorities to an improvement of *private* property "to the satisfaction of the commissioners," to prescribe such works "as they shall think fit to be used," no matter what the expense, appears to be of a dangerous tendency, and, it is submitted, is unnecessary for the attainment of the objects contemplated. The main drainage-works now in the most general use are proved to be of an unnecessarily expensive character, and the house-drains, *vide* § 12, 14, 21, unnecessarily large and costly. The fact of the excessive expense of the existing works may be accounted for from the circumstance of their being commonly designed by officers, who

as architects in private practice are accustomed to receive a per centage on all outlay, and therefore are not under the best motives to economy; and from the fact that the contractors for such works, who have an interest in a large expenditure, frequently obtain an indirect influence in its outlay. It is proved under the present inquiry that the excess of expenditure for the imperfect main-sewerage of the Metropolis cannot be less than 66,000*l.* in ten years in one district alone. (Mr. Butler Williams, First Rep., Vol. II. p. 462.) The house-drainage, as well as new main-drainage, both of which must be much extended before our towns can be rendered healthy, would be much retarded by being carried on in the present expensive scale, of at the least 4*l.* per house for imperfect work. To illustrate the aggregate expenses of such work, supposing that two-thirds of the houses in the fifty towns examined under the Commission required house-drains; assuming, at the ordinary distribution of population, one tenement for every five persons, then the immediate expenditure placed at the disposal of these uncontrolled and irresponsible bodies would be 1,600,000*l.*; whereas less than one-fourth of that sum would be required for the tube tile-drains, which the evidence under the Commission proves to be the best; and by the proposed system of the distribution of the charge over a period coincident with the benefit of the work, that fourth would be reduced to one-twentieth or one-thirtieth, and taken, as an increased rent, not from the owner, but from the occupier. To reduce these observations to a condensed form, I show the present system and the suggested improvement in a tabular form, introducing at the same time the expense for the introduction of water as detailed in paragraphs 50 to 60.

TABLE showing the PRESENT CHARGES for HOUSE DRAINAGE and WATER SUPPLY and the REDUCED CHARGES under the proposed system.

	Old Charge.	Reduced Charge.	Annual addition to the Rent at 5 per Cent. interest, and equal instalment of the principal.
House drain	4 <i>l.</i> 7 <i>s.</i> 6 <i>d.</i> ; 30 feet at 2 <i>s.</i> 11 <i>d.</i> per foot.*	Improved pipe drains, 6 <i>d.</i> per foot, including repairs; total 15 <i>s.</i>	10½ <i>d.</i>
Water-pipe and Apparatus.	4 <i>l.</i> for butt, ball, cock, and other apparatus.	For a pipe only, the butt being dispensed with by the introduction of a constant, instead of intermittent, supply, 6 <i>s.</i> 6 <i>d.</i> †	5 <i>d.</i> , total, 1 <i>s.</i> 3½ <i>d.</i> yearly charge, or ¾ <i>d.</i> weekly charge.

\* Average of Manchester and Salford, *vide* s. 9, 14.

† Average of Preston and Oldham, *vide* s. 55.

By this illustration it will be seen that instead of at once demanding 8*l.* 7*s.*, as on the present system, the demand will be for 1*s.* 3½*d.* annually, or for ⅝*d.* per week; but, if the owner prefer immediately to pay off the cost of improvement, he will be charged 1*l.* 1*s.* 6*d.* instead of 8*l.* 7*s.*; or, in other words, the immediate cost to Great Britain, for its annual increase of 59,000 new houses, would be 63,525*l.*, instead of, as on the present costly and imperfect system, 492,650*l.* for the improvements which, by the evidence under the Commission, are shown to be essential.

67. The present Acts in operation in Lancashire generally provide



for the cleansing of streets, but in vague terms; and in one instance, that of Liverpool, a retrograde movement has been made. In the reign of Geo. II. it was enacted, that the streets of Liverpool should be swept twice a-week at least (Mondays and Thursdays being specified); but now, with an increase of population, traffic, and filth, the authorities are contented with cleansing the streets "once a-week or ten days;" and as I have shown, § 34, the streets cannot be *effectively* swept once in three weeks; but the scavengers are sheltered under a new Act, which leaves undefined the times for sweeping, and repeals the salutary clause of the former Act. One point also is worthy of remark, that distinct power is given to the authorities by the 5 and 6 Vict. c. 106, to sweep courts and lanes, the word "street" being defined in the Interpretation Clause to include both of these. It is, therefore, not in Liverpool, as in other towns, that this most important provision for health is neglected owing to the want of statutory provision. The same definition of street has been inserted into the late Act for Manchester.

In one point all the local Acts are extremely defective by not following out the principle adopted in Scotland, of considering all the excreta of a town as public property, and providing for its systematic and frequent removal. In fact there is a provision in the Acts reserving the right of manure to the inhabitants of houses who are desirous to keep it. This clause has obviously been introduced to prevent opposition on the part of cottage-owners; its concession has produced that intolerable train of evils described in § 39; and has done more, by the sanctioning the use of open cesspools or ash-pits over all the towns of Lancashire, to increase the amount of sickness and death, than any other individual cause of disease with which I have become acquainted. And yet this concession to self-interest has been altogether a mistaken one. In Aberdeen, where similar concessions were demanded, but happily resisted, those who at first objected solicited to be included in the advantages which they saw their neighbours derive from the measure. Provost Blackie, of Aberdeen, says:—

"Many of the houses are provided with ash-pits, which are cleaned out by the scavengers at such intervals as may be convenient for the occupants of the houses, the stuff being removed before certain hours in the morning, as provided for by the bye-laws. Before the passing of the present Police Act, a great clamour was excited in those parts of the town where ash-pits could be conveniently kept, by the proposal to vest the whole dung in the Commissioners, and the consequence was, that the claim upon it in those districts was postponed for fifteen years. Before the expiry of that period, in the month of May last, a number of parties had voluntarily given up their dung to the scavengers, and very little complaint has been heard of in consequence of the change."

It is this vested right in the public to the excreta of towns, that enables Edinburgh and Aberdeen to accomplish the work of scavenging at an actual profit. *Vide* § 38.

68. I now proceed to examine the Building and Health Acts in operation in Lancashire, principally, I may premise, with the object of showing the necessity for some well-directed local inquiry, but independent of local interests, before any definite general measures, framed on metropolitan experience, should be applied to the provincial towns

which I have had under examination. I may instance, as an example of ill-considered legislation, the clause for the ejection of a certain class of cellar occupants, in the Health of Town Act for Liverpool, already referred to (§ 45). Had the Act been confined to the prohibition of cellar-dwellings in new houses, or to the *gradual* expulsion of the occupiers of those at present inhabited, the clauses would have been salutary and unobjectionable. But when we find, according to the evidence of the chairman of the committee appointed to enforce the provisions of the Act, that a compliance with the Act implied an expulsion of 23,000 persons, without any means having been taken for providing them with other dwellings, the powers given were excessively unjust and oppressive, and must, had they been enforced, have increased to a great extent the evils which they were intended to counteract. Conceive a literal adherence to the provisions of such a measure, and its sanction by the Legislature seems absolutely incredible. Twenty-three thousand, a number easily written but enormous in reality when applied to human beings, including the infirm, the aged, the suffering mother with her new-born infant, the weak, the sick—all expelled in one day from their wretched homes,—yet unprovided with any other shelter! This was the merciful power conferred by the Act. But such powers could not be enforced, and the corporation wisely extended the period for removal from the cellars. I say wisely, but still quite illegally, for the Act gives no such discretionary powers; and any common informer might, if he chose, recover the large penalties attached to the transgression of this law.

It is quite true that a local inquiry did precede this extraordinary enactment; but it was instituted principally for the purpose of enumeration, and did not comprehend many of the numerous points of a full investigation. On a *proper* inquiry, precedent to the framing of legislative provisions, by competent and responsible officers, who have no direct or indirect interest in carrying out the work, it would probably be found that, however great the inconveniences of such a general removal as that alluded to, the evils attendant on the present state of things are still greater, and that the change must be made as soon as possible, at every inconvenience. But the experience of the present Act shows that fixing a distant time for general ejection is inoperative, for the announcement is either neglected or is forgotten by large numbers; and this mode therefore practically resolves itself into fixing an immediate time for ejection, which is accompanied with this capital difficulty, that accommodation for the ejected cannot be procured; for, in the absence of progressive demand, builders will not erect fourth-class houses on a mere speculation. The course of proceeding obviously suggested by the present inquiry, to effect the desired objects, is such as the following:—

First, careful inquiry before determining the period at which the cellar-dwellings shall be abolished as to the number of suitable houses capable of being provided as substitutes; and as to the best manner in which a gradual vacation may be effected, taking care to empty, in the first place, such habitations as are most obnoxious to health.

In the mean time special exertions should be made to alleviate the most pressing evils suffered by the cellar occupants. Lime-washing should be freely resorted to; drainage, paving, and cleansing, both of



the cellars and courts, should be effected ; and water should be liberally supplied. Provision should be made also for the removal of patients, wherever fever or other similar disease was found to prevail. The cellars from which the patients were taken should be cleansed and whitewashed, in the mode practised at Edinburgh, as detailed in my examination of Mr. Ramsay. (First Rep., Vol. II. p. 383.) The use of ventilators might also be promoted. The money expended by the corporation of Liverpool, for one of their local Acts, would have sufficed to defray the expense of putting ventilators, of the description recommended by Mr. Toynbee, into every cellar-dwelling in the town.

Such alleviations having been provided, the general measures for effecting a change of residence might then be proceeded with. But the consideration of the work to be accomplished, points to the necessity of provisions which the Liverpool Bill does not contain, viz., discretionary powers of relaxation as to time, and alterations as to the mode of execution.

The effect produced by the adoption of the measure at Liverpool has been, up to the present time, one of physical inconvenience and of moral injury. The labouring classes who have been ejected from the cellars have, so far as can be ascertained, been driven into other inferior and ill-conditioned dwellings, and must have suffered great inconvenience from the change without deriving any sanatory benefits. They cannot have been impressed with any other feelings than those of disrespect for the law which put them to the inconvenience, apparently with so little purpose or benefit. With respect to the great mass of the labouring population, whom it has been found impossible to displace, who have also perceived the inconveniences but not the advantages of the law (which had not been previously justified, as of old, by any well-considered instructional proclamation), they have had the pernicious lesson given them of an imperative provision of the Legislature set aside, by themselves and by the common consent of the authorities, as absurd and mischievous.

69. An important point elicited by the present investigation is, that the means of protection against fire, by a copious and constant supply of water, are more efficient and economical, as far as regards this county, than the erection of party-walls such as those existing in London. In Lancashire, the new houses are almost universally separated by stone or brick walls, and their roofs tiled or slated, and not separated by lath and plaster, as was the case in London when the original Building Act was passed.

“In the houses for the labouring classes *anything* in the shape of a brick wall is quite sufficient to prevent” a fire extending from one house to another, provided the wall goes through the roof. In Manchester, where there are no party-walls, and no Building Act regulations, it appears, by a return from the superintendent of the fire brigade, that from the year 1829 to 1841 inclusive, only 35 fires occurred in cottage property. In only four, however, were the buildings consumed or much damaged ; two of those consumed being occupied as a wadding manufactory.

The extension of fires from the insufficiency of the dividing walls being almost nil, it is still a question as to whether the expense of providing against the evil, by means of the party-wall, may not be much

beyond the cost of other and better modes of protection ; it is more than five times the expense of laying on water, and more by one-third than the total expense of laying on a constant supply of filtered water, at high pressure night and day, as in Preston ; of providing a soil-pan apparatus or drain, and trapped sink to the house, and paying the share of a sewer in front of the house. Besides this excessive expense, the party-wall takes from the labourer 16 superficial feet of space, that is to say, room for one bed, or for a large clothes-press. If the building be extended to make room for the party-wall, so as to preserve the interior space of the house, then an additional expense must be incurred for additional building-land, for additional pavement, and sewer for the additional frontage. Mr. Foden estimates the expense of the party-wall at 8*l.*, including the measure for stability as now in operation in the Metropolis, viz., building it from the base upwards. The expense of a party-wall above the roof is estimated by Mr. Corbett, of Manchester, at 30*s.* in the following evidence :—

“ Fires are stated rarely to occur and seldom to extend in cottage property, and as the cost of a party-wall for a cottage might be about 30*s.* to insure against an accident which seldom happens, might this sum not be better applied in laying on water at high pressure, which would afford a means of checking fire in the house itself, and add additional facilities for cleanliness ? —In higher-class houses I think party-walls should be retained, because the expense bears a much less proportion to the cost of insurance than when applied to the lower-class dwellings ; but in the lower-class dwellings, the expense might be better laid out towards supplying water and water-closets. The annual cost entailed upon the tenant by a party-wall above the roof would be about 3*s.*, and if nine inches thick about 4*s.* 6*d.* The cost of laying on water would be 10*s.* The rental on 10*s.* in addition to the annual charge for water would, according to the present rates of this town, be about 8*s.*, which would be well laid out in the promotion of cleanliness and health, and would be valued by the occupants generally, who would much rather pay 8*s.* for an abundant supply of water than 4*s.* for a party-wall.”

In the evidence of Mr. Hopkins and Mr. Shorland, taken before the Committee of the House of Commons, it was demonstrated that the extra expense incurred by the required party-walls, and the extra thickness of the outer walls to fourth-rate houses, including the cost of extra land, extra sewerage, extra paving, and the surveyor's fee, would incur increased expense of from 14*l.* to 19*l.* each house, or an addition of from 13 to 14 per cent. on the present cost ; while the expense of laying on a constant supply of water, providing a sewer and house-drain, a water-closet, and ventilators to the rooms, would not amount to above half that sum.

But whilst I conceive the experience of Lancashire to point to the necessity of local inquiry previous to the introduction of measures *in detail*, I believe that the same experience also indicates the necessity for this inquiry being conducted by persons independent of local interests, and of competent attainments in general science ; the necessity for this is evinced in the desire to obtain independent opinions from a distance before the introduction of a supply of water or any other large improvement. As a practical instance of the evil of legislation exclusively local, we may again refer to the Liverpool and Manchester Sewerage Acts carried on in a subdivided natural area, not always in-



cluding all the districts essentially intra-mural, and neglecting altogether the suburban districts and adjoining lands, which ought for the health of the town to be under the jurisdiction of the Sewerage authorities. Thus all around Manchester and Liverpool, houses are springing up on undrained land, some of it actually saturated with moisture, and a great part in that wet and unhealthy state indicated by the growth of rushes. The Acts do not contemplate these new accessions to towns, and do not recognize their existence, until they have been for a considerable time exposed to all the evils which spring up with the buildings themselves. There has been no proper survey with a view to contour lines, so that it is a mere chance whether or not the new streets be laid out in localities capable of effective sewerage or removal of surface moisture. The absence of surveys causes the various evils and expenses alluded to in paragraphs 22 and 30. But still further instances of the evils of purely local legislation have been described in § 44, where we find regulations for the width of courts without reference to the height of houses; leading to the erection of lofty dwellings incapable of ventilation; and powers actually given to decrease the entrance of the courts by the erection of open cess-pools and privies; or, in other words, to poison the air entering by its only inlet for the ventilation of the courts. We also find the old objectionable provisions for the erection of privies and open cess-pools, which are proved to be more expensive than the soil-pan cleansed with water, as described, with estimates, in Mr. Coulthart's Report on Ashton. (First Rep., Vol. I. p. 306; and in Mr. Foden's Evidence, Vol. II. p. 315).

We see another instance of the need of careful local inquiry in the new town of Birkenhead, where, from the force of custom, and the habit of relying upon local experience, the chief evils, so destructive to the neighbouring town of Liverpool, of closed courts and alleys, cesspools and receptacles for decomposing refuse, have been recognized and propagated; although at the same time the most ample facilities exist for the removal of that refuse, by an admirable extent of main sewerage formed through the enlightened views of spirited proprietors even for streets not yet built upon.

70. It will be unnecessary for me to go into any detail with respect to the imperfections in the local Acts for the supply of water in Lancashire, as these have been sufficiently shown when treating of the small protection afforded to the public against inadequacy of supply, (§ 50, *et seq.*) The chief imperfection is the absence of power to secure a supply in the mains at all times, so as to be in readiness in case of fire, and to prevent the necessity for costly and inconvenient tanks in dwelling-houses. The local Water Acts, in every case, give powers to charge an enormous price for the water supplied, which, however, are rarely carried into effect, simply from the circumstance that the company would be losers instead of gainers by the excessive charge; as they are at present by the too high charges adopted all over Lancashire, as shown (§ 55, 59.)

There is not a single Parliamentary enactment for Lancashire, in which provision is made for the connexion of water supply with house or main drainage, the consequence of which is that the drains commonly act as so many extended cesspools. The expensiveness of the present supply in almost every instance, its insufficiency as to amount

in certain cases, and the absence of any powers to extend the supply and to rate the houses unsupplied, so as to afford an inducement for taking it, together with the want of proper protection for the public against the encroachments of the water companies, or the neglect of the important trust confided in them, all combine to offer serious obstacles to the sanatory improvement of the towns in Lancashire. Under the present system of four of the largest towns—Liverpool, Manchester, Bolton, and Wigan—there is little hope of amending the grievous evils occasioned in them by the numerous privies and open cesspools, nor even in the towns with an improved supply, on account of the expense, unless measures be adopted alike profitable to the companies and to the public, and insuring the latter an adequate degree of protection.

71. The neglecting to make the supply of water operate on the town drainage prevents the application of valuable refuse for productive use as manure. In two instances only, that of Preston and Bury, are there attempts made to apply the refuse of the towns to agricultural purposes; but these attempts are very feeble, and produce more evil than good. This is mainly owing to the want of dilution of the refuse, which not only would prevent the escape of odour, but also render the manure more fit for reception by the plants.

It is a recognised principle of agriculture, that the excreta of those animals which subsist upon a certain kind of food form the manure best adapted for the production of the same food; and hence the refuse of a town is the best productive manure for the food of the residents of that town. The enormous pecuniary value of this refuse should not be lost sight of, for the revenue derived from its proper application would form ample funds for the liquidation of all the expenses incident to the sanatory improvements of the town, and leave a surplus which might be devoted to architectural or other improvements. The lowest sum obtained per Scotch acre for meadows in the vicinity of Edinburgh, irrigated with the refuse of that town, is 20*l.*, and the average amounts to about 40*l.* In Manchester so much is the excreta of the town valued by the farmers in the neighbouring county of Cheshire, that they are at the great expense of carting away about 1500 tons, weekly, of this valuable refuse; as ascertained by an enumeration of the carts laden with this manure which pass the Cornbrook toll-bar; and the annual return of potatoes from this source, according to the evidence of Mr. Moore, “may be safely taken at 300,000 loads.”

Now when the transport of this manure by cartage is found to be remunerative, the profit must be much more considerable if the transport were effected by water, in a manner similar to, but, according to the improved state of science, more efficient than, that in operation in Edinburgh; the difference in the rate of transport, according to the evidence of Mr. Hawksley, being in the proportion of 4*s.* for cartage and 2½*d.* for conveyance by suspension in water. (5432.)

A few facts with reference to the economic value of the excreta of a town should be kept in view in considering this question. Human excrements contain (with the exception of one ingredient—silicate of potash) all the conditions essential to fertility. Estimating the amount of the solid and liquid effete matter of one man, at an amount so low as 547 lbs. per annum. (1¼ lb. urine, ¼ lb. fæces per day), so rich is this manure in phosphates, that the collected excrements of *two* men would



suffice to manure an acre of wheat or of peas; or that of one man a whole acre of turnips, supposing the green herbage were returned to the soil. In fact, when we recollect that a pound of urine contains all the ingredients necessary for the production of a pound of wheat, it seems incredible folly to allow all the valuable refuse to run to waste, in our large towns, and to send whole fleets to Ichaboe and the Incas for what we are wasting at home. In Flanders, where much manure is used, the collected excrements of a man for one year are valued at 1*l.* 17*s.*; but even supposing their productive value to be only ten shillings, or less than one-third the value as ascertained by the practice of Flanders, the manure obtained from the refuse of a population of 100,000, would amount to more than 3½ times the sum necessary for the introduction of all the requisite sanatory improvements in a town of a like population, which, according to the estimates I have already laid before you, would not exceed 14,000*l.* per annum.

The application of such refuse, therefore, while it would facilitate the introduction of sanatory measures, by affording the money necessary to defray the cost of improvement, would at the same time offer the means of removing the putrid and decaying matter which at present renders towns so unhealthy. The local Acts at present in operation in Lancashire do not seem to have contemplated this application, for they generally contain clauses prohibiting the removal of the refuse from the streets, by means of the sewers.

72. It is not my province to offer to your Board suggestions as to how such evils are to be remedied, as these should proceed from the Commissioners only in their collective capacity, and I would therefore finish this survey of the acts and usages now prevailing in Lancashire, by summing up the following conclusions, drawn not from hypothetical reasonings, but from the actual working of substantial measures and administrative machinery in the county under examination:—

(1.) That the topographical areas of the jurisdictions are generally so subdivided as to prevent unity of design and completeness of execution.

(2.) That the proper natural area is split into fragmentary jurisdictions in which improperly constituted authorities act with imperfect and irresponsible and often conflicting power.

(3.) That by expelling summarily, and without adequate preparatory arrangements, large masses of persons dwelling in districts intended to be improved, or in cellars, the present moral and physical evils of overcrowding are aggravated instead of diminished.

(4.) That by neglecting the provision of proper supplies of water for houses of all classes, the house-drains, when they exist, are rendered inefficient and injurious.

(5.) That omitting all securities for the skill and qualifications of the officers, and for the efficiency and economy of new works, they are excessively expensive and defective.

(6.) That sanctioning the continuance and extension of the practice of keeping refuse of cesspools and privies in towns, encourage a principal cause of atmospheric impurity, and of consequent disease.

(7.) That by prohibiting the use of sewers for street cleansing, and by recognising the practice of carting away accumulations in sewers instead of flushing them, the recent measures proposed as improvements have been, in fact, aggravations of the evils complained of.

## PHYSICAL CAUSES OF EXCESSIVE MORTALITY.

73. Having in the previous part of this Report described the condition of the structural and police arrangements in towns, the deficiencies of which are acknowledged causes of disease, I proceed to show that they produce consequences so serious to the public health as imperatively to call for the interference of the legislature. I consider it altogether unnecessary to cite specific instances of the origin or induction of epidemics from the presence of decomposing matter and other filth; for this, in the present state of our knowledge, is beyond cavil: but we are yet ignorant of the intensity and extent of the evil produced, of the enormous expense which these evils entail on the community, and of the class of immoral tendencies arising from continual exposure to preventible causes of disease. I have already laid before you very important evidence on this subject elicited during my inquiry, and described in the Reports of the Rev. Mr. Clay on Preston, Mr. Holland on Chorlton, and Mr. Coulthart on Ashton-under-Lyne. In these Reports, it was shown, that the physical causes of disease act powerfully in producing an excessive infantile mortality, in reducing the average duration of life of all classes, and in causing permanent pecuniary burdens to the community. As these Reports are already before you, it is unnecessary to reproduce them in verification of the additional statistics which I shall now present, not only as expressive of the physical causes of disease, but in the hope that similar methods may be adopted by residents in other towns and districts, for the purpose of ascertaining those localities which should be immediately improved. In every case I found, by personal inspection, the existing causes of disease, before I endeavoured to express them approximately by statistics.

74. The extent of the pressure of the removable causes of disease is best shown by a collateral view of the rate of mortality and average age at death in the localities under examination, showing, in the statistical results, the relative force which they exert upon the infantile, as well as the adult, part of the population, and on the artisan and tradesman, as compared with the gentleman or professional man.

75. After the evidence which you have received from Dr. Southwood Smith, Dr. Arnott, Mr. Toynbee, and Dr. Guy, and in the Reports which I have forwarded to you from Lancashire, it would be useless repetition to describe the nature of the diseases most frequently induced by the noxious agencies at present existing in all our large towns. It may be sufficient to state that these diseases are much more numerous than the public were aware of before the issue of your First Report. In addition to the large class of epidemic and endemic diseases, the relation of which to physical causes has long been recognised, we have now to add a considerable proportion of that large class of pulmonary diseases formerly exclusively ascribed to climatorial influences, and particularly of that class to which the infantile part of the population is so peculiarly prone,—scrofulous affections, or other diseases having their origin in the bad physical or moral condition of our large towns, and described in the registration books under the indefinite names of “consumption,” “debility,” “convulsions,” or “wasting.” But it is not by direct disease alone that the excessive mortality in our large towns



is produced: the continued exposure to morbid causes produces a low state of the system, inciting, as I shall afterwards show, to indulgence in dangerous and vicious propensities, and gradually bringing on premature old age and death. That these effects are produced by preventable causes I have obtained abundant evidence from an examination of the registration books. For example, I have pointed out (§ 27) that Wigan is in a very low state as to its sanitary arrangements, particularly an undrained part of the town situated on impermeable clay and abounding in filth of every description. To distinguish how far this bad physical state operated in the production of disease, I divided the town into two parts—the Market and the Scholes districts—the first being in a tolerable condition as to drainage and structural arrangement, the latter as bad as can well be conceived. Mr. Fairhurst, the Registrar for Wigan, with much zeal and care, proceeded to extract the deaths which had occurred in these districts, and I reduce the following Table from the returns with which he furnished me. It will be observed that the Table is corrected for any difference in the character of the population by a separation of the artisans from the gentry and tradesmen, and the result is just what might have been anticipated,—that the physical causes of disease in Wigan act in producing an excessive mortality all over the town, and in lowering the term of life of all classes and of persons of all ages, the evils being most intense according to the character of the district.

TABLE showing the rate of MORTALITY and Average AGES of DEATH at WIGAN, distinguishing the Well-conditioned from the Ill-conditioned Districts, reduced from Returns made by Mr. Fairhurst, the Registrar, for the Years 1840-41. (Corrected for the increase of population.)

DISTRICTS.	Population.	No. of Deaths, average of 2 Years.	No. of Births, average of 3 Years.	Proportion of Deaths to Population.	Proportion of Births to Population.	Per Centage of Deaths under 5, to Registered Births.
Market-st. (well conditioned District.)	12,455	341	437	1 in 36	1 in 28	35
Scholes (ill-conditioned District.)	13,076	447	569	29	23	44

DISTRICTS.	Per Centage of Deaths under 5, to Total Deaths.	Average Age of all who Die.	Average Age at Death above 13, (the factory Age.)	Average Age at Death above 21.	Average Age at Death of Gentry and Tradesmen.	Average Age of Death of Artisans.	Proportion of Deaths from Epidemics to Population.
Market-st. (well conditioned District.)	45	Y. M. 24 11	50	53	32·8	23·10	1 in 194
Scholes (ill-conditioned District.)	55	17 9	45	50	28·2	17· 1	103

By this Table we see that the tradesman in the Scholes district dies four years and a-half before the tradesman in the Market-street district ; and the artisan six years and three quarters sooner in the former than the latter. We also see that while one out of every 194 persons is annually cut off by a zymotic disease in the tolerable-conditioned part of the town, one out of every 103 is swept away in the ill-conditioned part. It will also be observed, that while one in 36 of the population dies in the Market-street district, as many as one in 29 dies in Scholes ; and that the proportion of births also is greater in the latter than in the former.

Now I refer particularly to this case, because it illustrates the prodigious amount of evils which may exist in a town without any knowledge of them on the part of the inhabitants. The Table now given points out Wigan as one of the most unhealthy towns in the kingdom, and yet I was assured by a gentleman, high in influence and in office in that town, on the occasion of my visit, that "Wigan was in very good condition and healthy ; and that it was nonsense making any inquiry about it ; for it required no improvement."

76. The causes of disease do not operate with less force in towns much more favourably situated with regard to structural arrangements, if parts of such towns show similar defects. As an instance of such a town I selected Ashton-under-Lyne, which I have described (§ 44) as generally more cleanly than any of the other towns examined ; but, observing that the cleanliness was much influenced by the presence or absence of sewerage in the streets, I requested Mr. Whitehead, the Registrar, who is intimately acquainted with the town, to divide the deaths, according to their occurrence in sewered or in unsewered streets. Mr. Whitehead devoted much time and attention to this analysis, and I present a reduction of the detailed returns furnished by him. The number of houses in the sewered streets amounted to 1840, in the unsewered streets to 2661.

TABLE showing the MORTALITY and Average AGE of DEATH in Sewered and Unsewered Streets in the Town of ASHTON-UNDER-LYNE, reduced from Returns made by the Registrar, Mr. Whitehead.

SEWERED STREETS.				UNSEWERED STREETS.			
Classes.	Number of Deaths.	Average Age at Death.	Per Centage of Deaths under 5 Years, to Total Deaths.	Classes.	Number of Deaths.	Average Age at Death.	Per Centage of Deaths under 5 Years, to Total Deaths.
Tradesmen .	147	25	..	Tradesmen.	39	33*	..
Artisans .	757	19	..	Artisans .	1,194	13 $\frac{3}{10}$	..
All Classes .	904	20	49	All Classes.	1,233	14 $\frac{10}{10}$	57

\* The cause of this high age, compared with the previous corresponding column, is obviously due to the small number of deaths from which the average is taken.

We find by the Table, that the duration of life in Ashton-under-Lyne is six years greater in the sewered than in the unsewered streets, and that there is an excess of 8 per cent. of infantile mortality in the latter over that of the former.

77. If we take a place possessing scarcely any drainage at all, such



as the town of Bury, we find a very high rate of mortality and low average age throughout the whole district, and particularly apparent in the worst conditioned parts, as shown in the following Table, drawn up by returns furnished by Mr. Harper, who has adopted an excellent system of analytical registration in the district under his charge, and rendered additionally valuable by the column, reduced from returns made by Mr. Fletcher, of the epidemics in the various districts.

TABLE showing the rate of MORTALITY and Average AGE of DEATH in Well and Ill-conditioned Districts in BURY, reduced from Returns made by Mr. Harper, Superintendent Registrar, and Mr. Fletcher, Surgeon.

DISTRICTS.	Popula- tion.	Deaths to Popula- tion.	Births to Popula- tion.	Per Centage of Deaths under 5, to Total Deaths.	Per Centage of Deaths above 21, to Total Deaths.	Average Age of all who Die.	Deaths from Epidem- ics to Popula- tion.
Bury-lane District . . . (Badly-drained, and many back-to-back houses, and very badly cleansed.)	2,016	1 in 26	1 in 24	52	33	16 $\frac{3}{10}$	1 in 155
King-street District . . . (Undrained, near the Ir- well ; and many courts— very densely peopled Dis- trict.)	1,643	26	23	62	25	13 $\frac{3}{10}$	109
Remainder of the Town . (Better-conditioned than the above.)	3,557	36	25	47	39	18 $\frac{3}{10}$	222*

\* The proportion of epidemics to the population (amounting to 2620) in the suburbs of the town is 1 in 262.

The two bad districts are strictly comparable as being inhabited by a like population, and consequently we find that King-street, situated in a worse sanatory position than Bury Lane, according to the evidence of Mr. Fletcher, shows clearly the action due to its unventilated courts, unsewered streets, and filthy surface, by its astonishing proportion (62 per cent.) of infantile mortality, and low average age of death, amounting to 14 years, and also in the frequency of epidemics among its population. In several of the houses in this district Mr. Fletcher found as many as 10 and 12 inhabitants per house. The following return made by Mr. Fletcher as to the density of population in some parts of the district, viewed with reference to the bad condition of the district generally, will sufficiently account for the enormous rate of mortality.

No. of Houses	Places.	No. of Sleeping Rooms.	No. of Persons.	No. of Persons to each Room.
10	Back King-street .	10	57	5 $\frac{7}{10}$
10	„ „ „	„	69	6 $\frac{9}{10}$
10	King-street . .	12	53	4 $\frac{5}{12}$
10	Tenter's Field .	12	47	3 $\frac{11}{12}$
12	Island . . .	12	71	5 $\frac{11}{12}$

Mr. J. Yorke Wood, another surgeon in Bury, found a similar density of population in the north and east part of that town, a circumstance which may account for the low age attained even in the better conditioned parts:—

An examination of 17 cellars gave . . .  $4\frac{6}{10}$  persons per cellar.

„ „ 63 two-roomed houses gave  $4\frac{9}{10}$  per house.

„ „ 67 four-roomed houses gave  $5\frac{7}{10}$  per house.

78. Dr. Duncan, in the Report already published, treats very fully on the evil effects to health arising from the density of population, and shows that the proportion of deaths from fever and consumption augments according to the increase of the density of population, as will be seen from the following Table, reduced by Dr. Forbes from the data given by Dr. Duncan:—

TABLE showing the Proportion of DEATHS from FEVER and CONSUMPTION, according to the density of Population.

TOWNS.	Ratio of Density of Population.	Inhabitants to one Death annually.		Per Centage, Proportion of Fever Deaths to others.
		From Consumption.	From Fever.	
Birmingham . . . . .	40	207	917	4.10
Leeds (Borough) . . . . .	87	209	809	4.48
Metropolis . . . . .	50	246	690	4.83
Manchester . . . . .	100	172	493	5.61
Liverpool and West Derby	..	..	488	6.23
Liverpool, (Parish) . . .	138	158	407	6.78

79. The evils arising from the density of population are obviously connected with the want of ventilation, and the filth generally in proportion to that density in the interior, as well as the exterior of the houses. It is difficult to obtain statistical returns to show the effects due to the former cause, which, however, must be more intense in its operation than the latter. If the deficiency in ventilation of courts and alleys produce marked effects on mortality and longevity, it follows, *à fortiori*, that the defective ventilation of houses must be productive of still more marked effects. In Chorlton many of the streets are closed at one end, forming in fact extensive courts (§ 44); and Mr. Holland, the registrar for that district, with his usual zeal in the promotion of our inquiry, undertook to examine the mortality in these closed streets, with reference to that existing in those inhabited by a like class of population in the adjoining open streets, and the results of his examination are contained in the following evidence:—

“With the view of trying to estimate how much of the extra mortality of ill-conditioned streets is due to obstructions, I have abstracted from my tables the numbers of registered deaths occurring during five years in eighteen streets of the third class, and of third class houses, but which are tolerably open and unobstructed, and eighteen others which are either built up at the end or the free circulation of the air otherwise impeded. In all other respects both the streets and the houses were, during the period in question, in as nearly as possible the same condition. The open streets inhabited by about 2,500 people have had about 424 deaths, or 3.4 per cent. per annum. The closed streets inhabited by about 1,800 people have had 387 dead, or 4.3 per cent. per annum, or nine per thousand inhabitants more have died in the obstructed streets. The whole of this great difference cannot fairly be attributed to the closeness of the streets merely. The



streets which are closed, being inaccessible to the scavengers' carts, are more dirty, and being less under superintendence, the filth which is thrown upon them remains for a longer time undisturbed. It is not unlikely, too, that they have more than the usual proportion of disreputable characters (whose dissipation and irregularities render them unhealthy), who choose these residences to shun the observation of the police ; and, as I believe, their inhabitants are of a poorer and more improvident class than those of the opener and more comfortable streets. Nevertheless, after making all just allowance for these complicating circumstances, a large portion of the excess remains to be accounted for by the want of proper ventilation, and the consequent foulness of the air, which the unfortunate inhabitants are forced constantly to breathe. The difference in the state of the air is often so great as to be evidently perceptible, not so much by the smell as by the feeling of depression which it produces after even a short exposure to its influence, and is quite enough to account for a much lower tone of general health, a greater susceptibility to disease, and a diminished power of resisting it, among those upon whom it is constantly acting."

So convinced are the authorities of Manchester of the evil effects produced by closed streets to the health of the community, that they have resolved, according to a proposal made in the Town Council by Mr. Prentice, to devote some of their funds to the opening of such streets.

The effects due to unventilated courts and alleys are further shown in a Table drawn up by Dr. Duncan. By this Table we see that the wards containing the largest proportion of courts and cellars also possess the largest proportion of deaths, particularly of those resulting from epidemics.

The mortality and sickness in unventilated courts vary according to their good or bad condition, as might be expected. Thus, in a return of a house-to-house inquiry in Preston entered into at my request by the Provident Society of that town, excessive mortality and sickness was found in courts generally, but prevailed with the greatest intensity in those in which the drainage was deficient, and even in those cases where, for a single year, the mortality might remain the same, the effect was distinctly perceptible in the additional cases of sickness, as will be seen by the following reduction of some of the returns :—

TABLE showing the MORTALITY, and DEATHS from FEVERS, in various Districts in LIVERPOOL, according to their Court and Cellar Population.

WARDS.	Per Centage of Population in			Fever Cases to Total Ward Population annually.	Total Deaths. Average of Two Years.
	Courts.	Cellars.	Courts and Cellars.		
Vauxhall . . . . .	45.44	12.76	58.20	1 in 27.44	1 in 23.50
St. Paul's . . . . .	24.74	11.33	36.07	37.66	30.67
Exchange . . . . .					
Castle-street . . . . .					
St. Peter's . . . . .	18.10	9.00	27.10	56.51	31.36
Pitt-street . . . . .					
Great George . . . . .					
St. Anne's . . . . .	26.22	7.83	34.05	109.30	31.51
Lime-street . . . . .					
Scotland . . . . .	31.28	9.32	40.60	77.02	31.74
Rodney-street . . . . .	15.98	6.38	22.36	237.18	41.62
Abercromby . . . . .					

—	Inhabitants.	Annual Number of Deaths.	Annual Number of Dispensary Cases.	Deaths to Persons.	Cases of Sickness to Persons.
15 Courts sufficiently drained	1,045	57	109	1 in 18	1 in 9 $\frac{6}{10}$
15 Courts badly drained . .	1,366	74	307	18	4 $\frac{4}{10}$

The result is very striking, that while both set of courts possessed the enormously high mortality of 5 $\frac{4}{10}$  per cent., more than 22 persons in every 100 in the undrained courts had serious cases of illness, and only 10 in every 100 in the drained courts.

80. Another proof that the rate of mortality depends on the character of the streets and houses, results from a careful examination, by Mr. Holland, of the mortality in different classes of streets and houses in Chorlton, by which it was ascertained that the mortality not only was greater in the worst streets, but a further advance in statistics was made by tracing this excessive mortality to the houses in which they occurred, as is illustrated by the following Table :—

TABLE showing the rate of MORTALITY according to the Class of Streets and Class of Houses in the Township of CHORLTON.

Class of Streets.	Class of Houses.	Computed Population.	Rate of Mortality.
			Per Cent.
1st . .	1st . . .	5,153	1.95 or 1 in 51
	2nd . . .	4,350	2.2 1 45
	3rd . . .	980	2.7 1 36
2nd . .	1st . . .	1,431	1.8 1 55
	2nd . . .	5,094	2.6 1 38
	3rd . . .	2,780	2.8 1 35
3rd . .	1st . . .	..	..
	2nd . . .	820	2.8 1 35
	3rd . . .	4,075	4. 1 25

Mr. Holland further shows, that while the mortality in the undrained streets of Chorlton amounts to four per cent., in the drained streets it is only two per cent.; and, although other causes than the drainage may co-operate in the production of this great difference, that it is the principal cause is shown by the positive and precise fact, that some streets containing 3,500 persons, and possessing a mortality of 1 in 32 of the population, immediately after sewerage, were elevated in the scale of health, so that deaths decreased to 1 in 39, or in other words, the deaths were diminished more than 20 a year out of every 110, even as a first effect of putting the streets in a proper condition as to sewerage. This immediate effect of improvement has been further confirmed by an examination of the number of deaths occurring prior and subsequent to sewerage in other districts of Manchester,—an examination for which I am indebted to the well known zeal of Mr. Ner Gardiner, the Superintendent Registrar of Manchester, and Mr. Noble, a surgeon of that town, and author of a work, which I have forwarded to you, ‘On the Influence of Manufactures on Health.’ In certain streets in St.



George's district, during the years 1838, 1839, the deaths amounted to 495: the streets were paved and sewered in the latter part of the last year, and, in 1841, 1842, the deaths reached only 432, being a decrease of 63, notwithstanding the increase of population. A district in Ancoats, improved at the same time, possessed 270 deaths in the two years prior to improvement, and 230 deaths in the two years subsequent, being a decrease of 40 deaths, without correction for the increase of population.

81. The effects produced in influencing the rate of mortality, or of sickness, the prelude to the former, by the character of the dwellings, was further shown in the examination alluded to in § 48. In the Old Church parochial schools in Liverpool, much care is taken to ascertain the cause of absence of the scholars, the master visiting the houses in each alleged case of sickness: the returns under this cause are therefore likely to be correct. From the following Table it will be seen that in the Moorfields school  $3\frac{3}{10}$  per cent. of scholars living in houses are always absent from sickness, and 27 per cent. of those living in cellars; in St. Matthias' school  $3\frac{7}{10}$  per cent. of occupiers of houses are always sick, and  $19\frac{6}{10}$  per cent. of those who live in cellars. The cause of the enormous rate of sickness among the infants in the former school, and the small rate in the latter, has already been explained by reference to the bad structural arrangements in the school, as shown in § 48.

OLD CHURCH PAROCHIAL CHARITY SCHOOLS, LIVERPOOL; showing the Average Number of Scholars absent from Sickness, living in different classes of tenement—(Drawn up from Returns made by W. Mather, Treasurer of the School.)

SCHOOLS.		Number of Children in the Schools.	Number who live in Cellars.	Number who live in Houses.*	Average of those living in Houses absent from Sickness.	Average of those living in Cellars absent from Sickness.	Per Centage of those living in Houses absent from Sickness.	Per Centage of those living in Cellars absent from Sickness.
Moorfields Schools	Boys	132	32	100	3	6	3	19
	Girls	140	50	90	2	8	2·2	16
	Infants	70	20	50	3	14	6	70
	Total	342	102	240	8	28	3·3	27
St. Matthias Schools	Boys	151	80	71	3	8	4·2	10
	Girls	170	85	85	5	13	5·9	15·3
	Infants	170	84	86	2	20	2·3	24·5
	Total	491	249	242	10	41	4·1	16·4
Total in both Schools		833	351	482	18	69	3·7	19·6

\* These houses contain, on an average, four families in each.

It was natural to expect that the depressing agencies at home would show themselves in the augmented rate of sickness of those peculiarly susceptible to their influences, but the result in the case of the schools at Liverpool was so striking, that I felt desirous to test it by a similar examination of schools in Manchester. Dr. R. Smith, who has on many occasions during this inquiry afforded me material aid, kindly undertook the examination, and the result was, as will be seen by the following Table, that 11 per cent. of residents of houses in streets were sick during the month preceding the examination,  $34\frac{6}{10}$  per cent. of

those living in houses in courts, and  $40\frac{8}{10}$  per cent. of those living in cellars.

TABLE showing the RATE of SICKNESS in CHILDREN attending certain SCHOOLS in MANCHESTER according to the Class of their Dwellings.

Name of Schools.	Scholars living in Houses in			Scholars frequently absent from Sickness living in			Per Centage of Sickness of those living in		
	Streets.	Courts.	Cellars.	Houses.	Courts.	Cellars.	Streets.	Courts.	Cellars.
Lancasterian, Boys'.	564	..	56	44	..	17	7·8	..	30·7
"    Girls'.	119	..	9	26	..	6	13·4	..	66·6
L. Mosely Street Infant School.	80	25	13	9	4	9	11	16	69
Travis Street, Infant	186	6	14	14	..	6	7·5	..	42·8
St. John's Boys' . .	142	3	11	14	1	5	9·8	?	45·4
New Jerusalem . .	184	18	12	35	13	4	19	72·2	33·3
Total . .	1,275	52	115	142	18	47	11	34·6	40·8

82. The previous statistics were obtained from an examination of districts in which the population was comparatively stationary. But when it is to a considerable degree influenced by the influx or efflux of migrants, the average age of death forms no longer the best means for ascertaining the pressure of the removable causes of disease, on account of the fallacious appearance of longevity given to the district by the adult migrants, as I have shown in the supplement to this Report. In such cases, when there are no means of distinguishing the resident from the migrant population, the mixed returns of the average age at death are not to be depended upon as the true index of the state of the district; but the proportion of deaths to the population generally offers an approximation to the truth. This will be seen by the following Table, framed from an examination effected by Mr. Spencer, with much care and labour, in which the average age of death has been fictitiously raised by some old persons, who were in this instance traced from Manchester, and had arrived in the district several weeks previous to their death; but although they gave the fictitious appearance of longevity to the district, being included in the actual enumeration of the houses, they do not effect the extraordinary difference in the rate of mortality,—which is double in the ill-conditioned district to that existing in the better conditioned part.

TABLE showing the MORTALITY, and Average AGE of DEATH, in badly drained and ill-conditioned Districts in the Town of ROCHDALE, as contrasted with localities well-conditioned in the same Town; both Districts being inhabited by the working class. (Reduced from detailed Returns made by Mr. Spencer, Registrar.)

DISTRICTS.	Population	Number of Deaths.	Per Centage of Deaths under 5 to Total Deaths.	Average Age of all who die.	Average Age of all who die above 13 Years.	Proportion of Deaths to Population.
Well-conditioned localities.	4,443	103	47	20	43	1 in $43\frac{1}{10}$
Ill-conditioned localities.	2,853	127	48	21	44	$22\frac{1}{10}$

Similar results attended an examination into the ill and better conditioned parts of the inferior districts of Manchester, where lodging-houses



for migrants abound. The average age at death in these districts appears to be nearly identical, but the pressure of the physical causes of disease is seen (there being no means of ascertaining the exact proportion of the resident to the migratory population, the latter being generally adult) in the proportion of *infantile* mortality, which is much greater in the ill than in the better conditioned districts. The streets forming the respective districts were selected by the Medical Union officer, and the extracts from the Registration-books were made under the direction of Mr. Noble and Mr. Gardiner. It will be seen that in every case the proportion of infantile deaths to total deaths is greatest in the worst conditioned districts.

TABLE showing the PROPORTION of INFANTILE DEATHS to TOTAL DEATHS in bad and better-conditioned Streets of a like Population in Manchester, (for Four Years).

Deaths.		Per Centage of Deaths under 2 Years.	Per Centage of Deaths under 5 Years.
544	Better Conditioned Streets, St. George's	47	60
901	Ill           "           "           "	50	64
696	Better       "           "       Ancoats	49	60
430	Ill           "           "           "	53	63
459	Better       "           "       Deansgate	45	56
662	Ill           "           "           "	67	60

The only exceptional result obtained during the whole inquiry was in the case of Bolton, in which a bad-conditioned district, containing 173 dwellings, possessed one year greater average age, and a similar infantile mortality to a better-conditioned district containing 466 houses. The Registrar's books were examined very carefully by Mr. Darbyshire, who made the return; but the exceptional result is clearly due to the small extent of the district under examination, for the deaths in the bad district amounted only to 29 per annum, in the better district to 68; both numbers are obviously too small to prevent the influence of accidental circumstances.

83. The instances of excessive mortality adduced in the preceding paragraphs may be sufficient to prove that physical causes of disease act in increasing the number of deaths and in diminishing longevity in the districts, where they are at present in the greatest intensity. These cases have been cited to show the comparative influence of the causes of disease, by contrasting a district excessively bad, with an assumed standard, in itself very defective. They have been also adduced as a proof, that the causes of disease act upon persons of all classes and of all ages. By extending our view beyond districts specially bad, the evils will be seen to apply to the whole community, acting with diminished or with increased force, according to the intensity of the existing causes of disease. The following table, showing the average age at death of different classes in towns of Lancashire, reduced from returns made to myself, when compared with similar returns made to Mr. Chadwick, with regard to Bath and Kendal, will sufficiently illustrate the truth of this remark.\*

\* The returns for Manchester and Liverpool are for the year 1841; on a previous year, according to Mr. Chadwick, the average age was 18 and 17 years respectively.

TABLE contrasting the AVERAGE AGE at DEATH of Classes in LANCASHIRE compared with KENDAL and BATH.

CLASSES.	Kendal.	Bath.	Liverpool.		Manchester.	
	Of all Ages.	Of all Ages.	Of all Ages.	Of Adults.	Of all Ages.	Of Adults.
Gentry and Professional Persons	45	55	43	58	38	..
Tradesmen . . . . .	39	37	19	48	20	..
Operatives. . . . .	34	25	15	47	17	..
Mariners . . . . .	..	..	22	48	..	..
Workers in Cotton Factories. .	..	..	..	..	..	..
Workers in Woollen Factories .	..	..	..	..	..	..
General Average . . . . .	36	31	20	48	22	49

CLASSES.	Ashton.		Preston.		Rochdale.	
	Of all Ages.	Of Adults.	Of all Ages.	Of Adults.	Of all Ages.	Of Adults.
Gentry and Professional Persons	30	50	47	61	34	56
Tradesmen . . . . .	21	50	31	54	26	50
Operatives. . . . .	16	50	18	50	18	49
Mariners . . . . .	..	..	..	..	..	..
Workers in Cotton Factories. .	..	..	..	..	15	39
Workers in Woollen Factories .	..	..	..	..	21	53
General Average . . . . .	16	50	19	51	21	..

There must be something radically wrong in a community, when the artizan reaches only 15 years of age, and has 28 years less chance of life than the gentleman from the day of birth, or 11 years less of adult life, and much more than that period of actual loss of working ability: and yet an examination of the following Table will show that this is actually the law in Liverpool.

TABLE showing the AVERAGE AGES of those who DIED at different Periods of LIFE, and in various CLASSES of the DISTRICT of LIVERPOOL, 1841 and 1842.

DESIGNATION.	Number of Deaths.	Average Age of all who Die.			Average Age of all who Die under 5 Years.	Average Age of all who Die above 5 Years.	Average Age of all who Die above 21 Years.	Per Cent- age of Deaths under 5 Years to Total Deaths.	Per Cent- age of Deaths above 5 Years, to Total Deaths.
		Yrs.	W.	M.	D.	Y.	M.	Y.	M.
Gentry and Pro- } fessional Men. }	268	43	0	0	0	1	0	53	8
Shopkeepers . . .	3,728	19	0	4	0	1	3	42	0
Artizans . . . .	7,743	15	14	0	5	1	4	40	0
Mariners . . . .	1,046	22	3	2	5	1	2	43	8
Undescribed . . .	646	25	0	2	3	0	11	40	10
Workhouse . . .	1,068	40	8	0	3	0	10	46	11
Infirmary . . . .	319	36	4	1	2	3	2	36	5
Total Average .	14,818	20	2	0	6	1	3	41	10
								48	3

NOTE.—In this Return there are 86 deaths less than those given by the Registrar-General for 1841, and 59 deaths less than those given for 1842. The cause of the error could not be traced without very much labour; but in the aggregate number of nearly 15,000 deaths cannot affect the average age of death above a few days at the most.



84. The extreme low age in the principal towns of Lancashire obviously indicates an excessive infantile mortality, and the relative rate of this mortality may be taken as the most expressive index, not only of the physical, but, as I shall afterwards show, of the moral causes of disease. Mr. Robertson, in his account of the statistics of mortality in Manchester, points out the immense amount of infantile mortality in that town. He says:—

“ The immense amount of infantile mortality in the township of Manchester, for instance, is seen by comparing the deaths, under the age of one year, with the same for Dorsetshire. From the table it appears that for every 100 infants of either sex in this township under 12 months, upwards of 33 males and 26 females annually die; whereas, in Dorsetshire, the proportions are less than half those numbers. For the next period of life (for one or two years), the per centage of male deaths is nearly 18, and of female deaths upwards of 16; but in Dorsetshire the proportions are less than one-fourth of this amount. Between the ages of two and five, the deaths are above 6 per cent.; while, in Dorsetshire, the per centage is under 1½. Again, the mortality in the township of Manchester, for all under five years, taking both sexes, is nearly 14 per cent.; in Dorsetshire, only about 4 per cent. In the townships of Cheetham with Crumpsall and Broughton, the mortality under five differs widely from that in the rest of the townships, being nearly as low as it is in one of the agricultural counties.”

TABLE showing the relation of DEATHS to BIRTHS, and the Average AGE at DEATH at various Ages, in different DISTRICTS of the MANCHESTER UNION, not corrected for increase of Population.

DISTRICTS.		Popula- tion.	Deaths Average of Five Years.	Births Average of Five Years.	Propor- tion of Deaths to Popula- tion.	Propor- tion of Births to Popula- tion.	Per Centage of Deaths under 5, to Total Deaths.
Suburban Districts.	Ancoats . .	42,254	1,320	1,636	1 in 32	1 in 26	60
	Deansgate . .	33,093	1,082	1,190	30	27	56
	London-road .	28,912	939	1,162	30	25	56
	Market-street	27,832	739	855	37	32	50
	St. George's .	31,576	990	1,300	31	24	64
	Cheetham . .	8,825	170	262	51	33	57
	Failsworth . .	4,545	76	137	49	33	57
	Newton . .	7,382	159	253	46	29	49
Prestwich . .	4,144	82	114	50	36	58	

DISTRICTS.		Per Centage of Deaths above 5, to Total Deaths.	Average Age of all who Die.	Average Age of all who Live.	Average Age of all who Die under 5 Years.	Average Age of all who Die above 5 Years.	Average Age of all who Die above 21 Years.	Per Centage of Deaths under 5 Years to Births.
Suburban Districts.	Ancoats . .	40	14	24.6	Y. M. 1 5	34	50	48
	Deansgate . .	44	18	25.1	1 6	38	45	53
	London-road .	44	18	25.4	1 3	39	47	47
	Market-street	50	21	26.3	1 0	41	50	43
	St. George's .	36	14	24.8	1 5	37	46	49
	Cheetham . .	43	25	25.1	1 2	42	50	37
	Failsworth . .	43	23½	..	1 0	39½	50	37
	Newton . .	51	21	..	1 2	41	49	34
Prestwich . .	42	27	..	1 1	46	53	45	

The preceding Table shows several very important facts, to which I shall have occasion to allude, but is here adduced as an illustration of the excessive infantile mortality in the urban compared with the suburban districts of Manchester. It shows that while 50 per cent., or one half, of all the children born in the urban districts are swept off before they attain 5 years of age—in fact before they attain an average of  $1\frac{1}{2}$  year—only 36 per cent. die in the suburban districts, and that the average age of death of those who survive 5 years is diminished by the same number of years in the former districts, although the suburban districts themselves are very low in the scale of health, when compared with others of an average rate of mortality.

85. It is necessary to consider the infantile mortality in relation to the births, and not with reference to the actual number of children at any given age, as ascertained by the census, because it very curiously happens, as pointed out by Mr. Robertson in the following portion of evidence, that, notwithstanding the copious stream of births to supply the loss by deaths, the numbers alive at certain ages are not much greater in the unhealthy than in the healthy districts:—

“A large amount of the mortality of a community like Manchester, so prolific in births, falling, as will be by-and-by shown, on the early years of life, it might naturally be inferred, *à priori*, that the numbers alive at the same early ages would be found to be large; in other words, the deaths under the first year, for example, being very numerous, that the kind of population by which the deaths are supplied, would likewise be so too in some corresponding proportion: but this we shall find is not altogether the case. In truth so great and rapid are the ravages of death under the first year in most of the townships, that the duration of infantile existence needs to be counted by hours or days rather than by months. For instance, the late census was taken on a given day of the year; but the number of infants in Manchester (notwithstanding the copious stream of births by which the waste of life in this town is made up) was found to be hardly more in proportion than in one of the southern agricultural counties, where the ratio of births is little more than two-thirds as high. The proportional numbers which were born and lived in the town in the course of the year of the Census, it is true, were comparatively with those of the supposed agricultural county much greater; but, owing to the far briefer duration of infantile life, the proportional number of infants in Manchester, on any single day in the year, was actually found to be not considerably greater.”

He shows this by tables inserted in the Appendix.

86. All the evidence obtained during this inquiry proves that the infantile part of the population is peculiarly influenced by the common causes of excessive mortality. The largest proportion of deaths in Lancashire consists of those who do not survive the perils of childhood, as will be seen by the evidence which I have already forwarded to you. In Ashton-under-Lyne, for example, 57 per cent. of the deaths are due to infants under 5 years of age; in Preston 53 per cent., in Liverpool, 52 per cent., and in Manchester, 48 per cent. die under the same age. It is partly this circumstance, which produces a difference in the average age of the living and of the dead, as exhibited in the last table, for the town is affected by the migration of adults who increase the apparent age of a population, when deduced from the returns of the census. The great infantile mortality occurs for the most part



among the poorer part of the population, as is seen from an examination of the return from Preston:—

Gentry . . . . .	18 per cent. of deaths under 5.
Tradesmen . . . . .	36     „     „     „
Operatives . . . . .	55     „     „     „

87. This may account, in a great measure, for the following very startling Table, drawn up by Mr. Cartwright. It will be observed, that while in 1783 the average age of death was 31 years in Preston, and the per centage of infantile mortality 29 per cent., the average age of the same town at the present time is reduced to 19½ years, and the infantile mortality increased to 53 per cent., the latter augmenting in proportion to the increase of population.

The AVERAGE AGE at DEATH, and COMPARATIVE MORTALITY of CHILDREN, in the Years 1783-1791, and the Five following Census Years (calculated from the Preston Parish Church Registers), showing that the Progressive Reduction of the Duration of Life, and the Increase of Mortality among Children, have been almost in inverse proportion to the increase of Population.

Years.	Average Age of Death.	Per Centage of Persons Dying.		Number of Burials.			Population.
		Above 5 Years old.	Under 5 Years old.	Above 5 Years old.	Under 5 Years old.	Total.	
1783	31.65	70.712	29.288	169	70	239	About 6,000
1791	28.609	55.057	44.943	98	80	178	About 8,000
1801	23.252	55.608	44.392	238	190	428	11,887
1811	19.998	48.685	51.315	185	195	380	17,065
1821	18.942	43.427	56.573	218	284	502	24,575
1831	23.39	67.79	32.210	481	230	711	33,112
1841	19.54	46.64	53.36	465	532	997	50,131

Similar results attend the examination of the parochial registrars of other towns. Thus I find by an analysis of the registration books of St. Nicholas' church in Liverpool, that a diminution of the average age of death has occurred; from 1784 to 1810 the mean age of death varies from 24 to 26 years, but during the last seven years it varies from 17 to 20 years.

TABLE showing the AVERAGE AGE of DEATH in LIVERPOOL from 1784, according to the Increase of Population.

					Population.
1,863 Deaths, 1784 to 1789, Average Age of Death 24 Years.	1790 .	55,732			
2,689     „     1800     „     1810     „     „     26     „	1811 .	94,376			
14,818     „     1841     „     1842     „     „     20     „	1841 .	223,003			

The diminution is due to new or increased causes of mortality operating principally upon the poorer and middling classes; for we find the mean age of the gentry from 1784 to 1810 exactly the same as at present.

TABLE showing the AVERAGE AGE of DEATH of all Classes in LIVERPOOL, from 1784 to 1810, and in the Years 1841-42.

	1784-1810.	1841-1842.
Gentry . . . .	43 Years.	43 Years.
Tradesmen . . .	23½ „	19 „
Operatives . . .	18¼ „	16 „
Females . . . .	29 „	? „
All Classes . . .	25 „	20 „

These Tables prove that either new or increased causes of mortality have come into operation in Lancashire within recent years, acting principally, but, as I shall afterwards show, by no means exclusively, on infantile life.

## RELATION OF BIRTHS TO DEATHS.

88. The enormous waste of infantile life in Lancashire must obviously be accompanied by an equivalent number of births to furnish subjects for the scythe of Death. This, as a fact in political economy, is a very important consideration; for, however ungrateful to our feelings such sentiments may be, there are objections made to sanatory improvements by many persons who consider disease and pestilence as the natural checks to the increase of population; whereas, facts—as will be presently shown—point to the opposite conclusion. In the Table which I have already given of the statistics of births and deaths in the urban and suburban districts of Manchester, it will be seen, that while the births are 1 in 26 of the population in the unhealthy parts, they are only 1 in 33 in the more healthy districts; and this will be still better seen by comparing the births and deaths in the natural divisions of Manchester, as adopted by Mr. Robertson, who remarks upon the Table that—

“It appears that the proportion varies from 1 birth in 21·91 persons for the township of Hulme, occupied chiefly by the labouring class, to 1 in 36·48 for Broughton, inhabited generally by the middle and upper classes; and for the town of Manchester, as a whole, 1 in 25·19. With this may be compared the proportion for England, which is 1 in 31; for Wales, and for the Metropolis, 1 in 34; for Devon and Hampshire 1 in 36; and for Salop, which is 1 in 37,—a comparison which shows the surpassing fecundity of this manufacturing community.”

TABLE showing that, where there is an Excessive Number of Deaths in Manchester, there is also an Excessive Number of Births.

Township of	Annual Deaths.	One in	Per Cent.	Annual Births.	One in
Manchester	5,499	29·79	3·35	6,263	26·16
Salford . .	1,644	52·36	3·09	2,308	23·05
Chorlton . .	727	38·97	2·56	1,085	26·11
Hulme . . .	801	33·68	2·96	1,231	21·91
Pendleton . .	271	40·70	2·45	444	24·84
Ardwick . .	282	35·12	2·84	437	22·66
Cheetham . .	159	55·51	1·80	270	32·69
Broughton . .	62	61·19	1·63	104	36·48
Total . . .	9,445	32·39	3·08	12,142	25·19



89. This great fecundity is of course to a certain extent dependent on the large proportion of marriages to the population; although it is not, as supposed, peculiar to Lancashire, but incident to its high rate of mortality, and is found to exist in towns in other counties, when the causes of excess of mortality prevail, as shown in unhealthy sub-districts in Yorkshire, where the mortality was excessive, the births were as great as 1 in 16. The proportion of marriages to the population in England is 1 in 127, in Wales 1 in 141, while in Lancashire, it is as great as 1 in 102. In some parts of Lancashire, in which the infantile mortality is the greatest, marriages are rare; but in such cases illegitimate births are always found to be frequent, as is shown in the following Table drawn up at my request by Mr. Coulthart, with reference to Ashton-under-Lyne, a town with 57 per cent. of infantile mortality.

TABLE showing the RATIO of BIRTHS and DEATHS to POPULATION, and the Proportion of Illegitimate Children born to Total Births, at ASHTON-UNDER-LYNE and several places adjoining.

Localities.	Population in 1841.	Ratio of Total Deaths to Population.	Ratio of Total Births to Population.	Proportion of Illegitimate Children Born to Total Births.
Ashton-under-Lyne, Town . .	22,700	1 in 32.4	1 in 27.6	1 in 12.8
Audenshaw and Droylsden . .	10,310	47.2	29.2	12.4
Knott Lanes . . . . .	5,493	41.3	32.1	17.1
Harthead . . . . .	12,745	23.6	22.3	14.2
Denton and Haughton . .	6,760	39.7	24.9	10.9
Dukinfield . . . . .	22,390	32.1	24.	15.2
Newton and Godley . . .	8,900	38.6	23.	10.5
Staley . . . . .	4,704	46.5	29.2	10.8
Mottram-in-Longdendale . .	7,596	41.5	31.5	13.
Total of Ashton District .	101,598	34.2	26.5	13.1

Thus, in a town possessing an unusually high infantile mortality, even when contrasted with Manchester or Liverpool, the marriages are only 1 in 152 of the population; but every thirteenth child is illegitimate, while in Manchester the illegitimate to the legitimate children are as 1 to 21. Early marriages also contribute to this abnormal increase of births. Thus, out of 2824 married men working in factories in different parts of Lancashire, I found that the average age of marriage among males was not above 23 years. Early marriages and excessive births are moral and natural evils flowing directly from removeable causes of excessive mortality. Mr. Cartwright made an analysis of the infantile mortality in Preston for six years, and found that out of 4751 deaths occurring under 5 years of age, 3616 or 76 per cent. were under two years of age, and the average age of death of the latter number was only 9 months. This, in other words, signifies that 76 per cent. of all the children dying are cut off before they are weaned; so that the mothers are soon in a condition again to add to their families. This excessive mortality acts, therefore, as a direct cause in the production of excessive births; and this is still more clearly seen if a

district especially unhealthy be compared with one less unfavourably situated. In the unhealthy district of Wigan called Scholes, § 75, the births amount to 1 in 23 of the population, and in the more healthy district of Market-street to 1 in 28. The same result followed the examination of births in all the places adduced as examples of ill-conditioned districts.

The connexion between excessive births and excessive mortality is, by this time, sufficiently obvious; and careful investigation into facts has brought the indisputable conclusion that disease and pestilence do not always check the increase of our species. Nay—singular and incredible as it may appear—these scourges are not merely powerless to restrain, but they actually give an impulse to, population! The facts exhibited in the preceding sections will, I apprehend, convincingly show that a crowded and unhealthy district, with all its inevitable accompaniments of low morals and low intelligence,—where the condition of human beings is scarcely above that of animals,—where appetite and instinct occupy the places of higher feelings,—where the barest means of support encourage the most improvident and early marriages,—is not the place where we shall find a diminishing or even stationary population. For the early unions there are followed by early offspring; and although more than half that offspring may be swept away by disease during infancy, yet nearly a third of it will grow up, in spite of all the surrounding evils, to follow in the steps of their parents, and, in their turns, to continue a race, ignorant, miserable, and immoral as themselves.\* (*Vide* Table, sec. 92.)

#### GENERAL EFFECTS OF CAUSES OF DISEASE.

90. Having, in the previous section, endeavoured to show, by special cases, that the physical causes of disease act—

1. By increasing the rate of mortality;
2. By diminishing the duration and value of life of all classes and of persons of all ages;
3. By causing an enormous amount of infantile deaths which are immediately replaced by an excessive number of births,—

I adduce the following table in order to show that these causes of disease are not confined to any one place or district, but operate throughout all Lancashire. In its consideration I would direct attention to the comparison of the different districts with Ulverstone, which possesses an average degree of mortality and value of life not exceeding that found in many districts in England; the population of this assumed standard being 26,746, and the annual deaths 472, of which 313 are adults above 20 years of age. The table is drawn upon the experience only of one year, and therefore must be considered merely as an approximation; but as we know circumstances vary inconsiderably, neither will the results.

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\* If we suppose a district of 50,000 inhabitants, with births as 1 in 22, and deaths as 1 in 33—a ratio not actually so unfavourable as that of Holme—a little calculation will show that, by the end of 12 years, the population will have swollen to nearly 60,000.



STATISTICS OF MORTALITY in the County of LANCASTER for the Year 1841.

General Table of Mortality.

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STATISTICS OF MORTALITY IN THE COUNTY OF LANCASTER FOR THE YEAR 1891																
REGISTRATION DISTRICTS.		Proportion per Cent of Deaths to Total Deaths.														
Average Age at Death of the Whole.		Average Age at Death of all who Died above 20.		Under 1 Year.	Under 5 Years.	Under 15 Years.	Under 20 Years.	Between 20 and 30.	30 and 40.	40 and 50.	50 and 60.	60 and 70.	70 and 80.	80 and 90.	90 and upwards.	
Y.	M.	Y.	M.													
Liverpool . . . . .	20	5	48	1	25.1	52.3	59.	61.1	6.9	8.4	7.2	5.4	5.6	3.7	0.3	
West Derby . . . . .	21	0	50	2	25.4	51.1	60.	61.9	6.7	7.4	5.7	5.3	6.1	4.6	0.3	
Ormskirk . . . . .	27	3	56	10	10.2	39.2	62.2	56.4	6.1	5.5	5.9	4.4	7.8	6.8	1.5	
Fylde, Garstang, and Clitheroe . . . . .	33	9	56	2	20.3	32.9	40.7	45.1	10.	7.1	4.9	5.1	9.5	7.2	1.	
Lancaster . . . . .	33	6	53	1	17.9	29.1	35.4	40.2	9.7	10.6	7.3	7.4	8.5	10.2	0.8	
Ulverstone . . . . .	41	8	60	7	16.3	23.9	29.	33.7	9.7	5.1	5.9	6.4	9.5	18.2	1.7	
Burnley . . . . .	22	1	50	6	25.1	46.5	55.9	60.9	9.2	5.	4.6	6.4	5.4	5.1	0.3	
Todmorden and Haslingden . . . . .	25	11	52	11	23.8	47.	49.8	55.3	8.5	6.1	4.9	7.1	7.3	6.9	0.1	
Blackburn . . . . .	23	6	51	5	27.3	47.	53.8	58.	9.3	5.7	4.6	5.5	6.3	7.2	0.4	
Preston . . . . .	22	0	51	10	25.5	48.4	57.7	61.7	7.6	5.7	4.6	4.9	6.1	5.	0.2	
Chorley . . . . .	24	10	51	4	25.2	42.8	51.2	55.6	8.9	7.9	5.6	5.3	6.6	6.4	0.4	
Rochdale . . . . .	23	2	51	4	24.8	45.2	55.	59.2	7.7	6.8	5.2	5.	5.5	5.6	0.3	
Bury . . . . .	21	0	49	3	24.3	47.3	57.9	62.	8.6	6.3	5.4	5.2	6.6	5.3	0.4	
Bolton . . . . .	22	0	53	11	26.1	49.3	57.8	61.7	6.6	6.6	4.9	6.3	8.7	6.0	0.4	
Wigan . . . . .	25	10	53	10	24.7	43.5	51.5	55.7	8.2	5.7	4.4	5.9	5.8	7.0	0.5	
Leigh and Prescott . . . . .	24	9	52	8	23.	44.5	53.5	56.9	7.8	6.8	5.6	5.	7.9	7.3	0.5	
Warrington . . . . .	26	7	54	3	23.1	41.5	51.	54.7	6.6	6.6	7.	5.8	5.9	4.9	0.1	
Chorlton and Worsley . . . . .	21	0	50	7	26.7	51.5	58.9	62.4	6.5	7.	5.4	6.5	6.6	4.9	0.2	
Manchester . . . . .	22	11	49	4	24.9	47.9	54.3	57.	7.5	8.1	7.5	5.1	6.5	4.2	0.2	
Salford . . . . .	20	8	49	6	29.6	52.3	59.1	61.8	6.1	8.4	6.1	4.8	5.7	4.	0.3	
Ashton . . . . .	20	11	48	2	28.8	47.9	55.1	61.5	9.9	6.2	5.3	4.8	5.7	4.	0.3	
Average . . . . .	22	10	59	2	25.5	47.4	55.2	58.8	7.8	7.1	5.9	5.6	6.4	5.4	0.3	
Total Numbers . . . . .	..	..	..	..	11,395	21,212	24,689	26,320	3,477	3,173	2,654	2,502	2,860	2,422	1,171	150

Total Number of Adults prematurely dying . . . . . 11,806  
Proportion per Cent. to Total Deaths . . . . . 26.4, or, to every 10,000 of the Population 68  
Number of all classes killed by Epidemic, Endemic, and Con- }  
tagious diseases . . . . . 9,467. . . . . or, 55  
Proportion per Cent. to Total Deaths . . . . . 21.1, or 1/5th.  
Deaths of all classes from diseases of the Respiratory Organs . }  
Proportion per Cent to Total Deaths . . . . . 12,585 . . . . . or, 73  
28.1, more than 1/4th.

It has been stated by Mr. Chadwick that the annual slaughter from one disease alone—typhus—a disease which formerly raged in, but is now banished from, our prisons and our navies—is greater in England and Wales than the loss sustained by the allied armies at the battle of Waterloo. Yet what sort of battle do we here find fought and won by preventible disease against the population of the county of Lancaster! The labouring population of this county have always supplied a large contingent to the armies of the country. It furnished the strength of the army which fought at Flodden; and Cromwell, speaking of his Lancashire regiment, said finer soldiers were never seen on a battlefield. The Guards, until recently, were largely recruited from Lancashire. What would be thought of a war in which 5000 of the able-bodied men of one county fell every year in battle; and yet this is only *one-half* the number annually slaughtered in that county by removable epidemics!

Yet this annual loss of able-bodied men, so much greater than the most cruel of known wars in modern times, is scarcely more severe than the loss sustained by the continued physical deterioration of the survivors. It was a matter of constant complaint to me, by the recruiting officers in the various districts of the county, that the sons are less tall than the fathers, and that the difficulty is constantly increasing of obtaining tall and able-bodied men.\*

\* I found the indications of recruiting officers often very shrewd and useful; but without one exception they complained of the difficulty of getting men "to pass the surgeon" in this county. As an example, I may adduce the evidence of Sergeant Farrell of the 47th Regiment:—

Have you long been engaged in the recruiting service?

For nearly ten years.

Do you find it equally easy to recruit in Lancashire now as formerly?

Where I could get ten recruits formerly, that I could venture to send up, I can now only get one, and that one is often rejected. Out of seven I got lately, only one passed.

Do you think that this difficulty arises from people getting better wages at factories than in the army?

No, not at all. When persons go to work so soon they do not grow up to be the proper size, they have always some deformity; and in the towns, somehow or other, they are pale, sickly, and thin in flesh. The only place where I can get good men is from the country districts.

What reason does the surgeon assign for refusing the men you send from the towns?

For being too thin; not being round chested; and not standing straight.

From what towns do you find it most easy to procure good men?

I have been only in Yorkshire, Somersetshire, and Bristol. In Yorkshire there are some good men, better than I have found in Lancashire; but they are by far the best in Somerset. In that and other country districts I could easily get good men; but here, in Rochdale, there is almost no use in staying. I have only been able to pick out 30 good-looking men for the last 18 months, and out of these only one was passed by the surgeon for every four rejected.

Through the politeness of the head recruiting-officer of the Liverpool district, which includes Lancashire, Cheshire, and parts of Shropshire, Derby, North Wales, and Staffordshire, I have obtained returns of the number of persons sent up from various districts, and rejected as unfit for service. The total number sent for inspection from all the districts to the staff-surgeon in Liverpool, between the 1st of January, 1843 to 31st October, 1843, was 1560, of which 876 were approved, 684 being rejected. In Liverpool, during the same time, 930 were presented for examination, 439, or 47 per cent., being rejected. Of the 491 admitted, only 54 were natives of Liverpool, 218 being from other parts of England, 180 from Ireland, the remainder



91. In connection with the rate of mortality, it is very important to consider the amount and average duration of sickness among the lower classes. The data in my possession only enable me to form an approximation to the truth; for there are few institutions containing whole families dependent upon them for relief. The medical clubs, known at Ashton-under-Lyne by the names of "Boards of Health," are examples of such institutions; but, according to the evidence of Dr. Strange, they do not generally contain the poorest class of patients. The following returns made by Dr. Strange, Mr. Brewster, and Mr. Mostyn, the medical officers of these boards, exhibit, notwithstanding the absence of the lowest class, an enormous amount of sickness.

TABLE showing the AMOUNT of SICKNESS among the Members of the following Sick Clubs.

Name of Institution.	Number of Members.	Number applying from Sickness during the Year.	Annual per Centage of Sickness.	Duration of the Sickness.
				Days.
Board of Health . . . .	2,400	5,681	236	4
New Dispensary . . . .	2,500	3,400	136	18
Medical Association. . . .	700	1,000	143	7
General Average . . . .	5,600	10,081	180	10

The above medical institutions obviously differ in the class of their patients, but the average of the whole is probably a fair representation of the mixed classes; and, if it be so, we obtain the astounding result that 100 per cent. of the working population of Ashton-under-Lyne require medical attendance 180 times every year; and that, taking one person with another, every member of the above institutions suffers 18 days' sickness annually; although, in a large proportion of cases, it is not of such nature as to incapacitate from work. Extraordinary as is this return, it receives confirmation from other returns obtained from data quite dissimilar. Thus, Mr. Robertson, from a consideration of

from Scotland and Wales. The Liverpool subdivision, including Liverpool, Chester, Middlewich, Preston, Warrington, and Blackburn, sent in 955 men, of whom only 436 were approved, 54 per cent. being rejected.

The Manchester subdivision, including Manchester, Oldham, Macclesfield, Ashton, and Rochdale (Manchester sending the largest proportion), sent in at the same time 358 men, of whom 102, or 28 per cent., were rejected. The Newcastle subdivision, comprising Newcastle, Stafford, &c., offered 163 men, of whom 40, or 24, per cent., were rejected; the Shrewsbury division sending in 84 men, of whom 23 or 27 per cent., were rejected as unfit for service. The following Table gives the general results:—

TABLE showing the per centage of RECRUITS rejected as UNFIT for SERVICE out of those sent up for examination to the Staff Surgeon at Liverpool.

930 recruits sent from Liverpool (Town)	47 per cent. rejected
955       "       Liverpool, subdivision	54       "
358       "       Manchester       "	28       "
163       "       Newcastle       "	24       "
84       "       Shrewsbury       "	27       "

the numbers attending dispensaries, &c., in Manchester, concludes that every person in that town is sick at least once during the year. By personal inquiry of nearly 3000 factory operatives, the answers generally agreed in ascribing to each family 17 or 20 days' sickness of such nature as to incapacitate from work, being an average of four or five days to each person. The following returns of 11 sick-clubs in Preston, collected with great pains and care by Mr. Holden, will show that the cases of sickness incapacitating from work amount to 20 per cent., and their duration in these clubs nearly to six weeks.

TABLE showing the RATE of SICKNESS, and Amount of RELIEF afforded by Sick Clubs, in Preston.

	Total Members.	Sick during Year.		Average Period of Sickness in Weeks.	Average Payment to each Sick Person.		
		Members.	Per Centage.				
Tee-total. . . . .	37	2	5.4	3.	£.	s.	d.
Managers . . . . .	47	5	10.6	8.2	1	10	0
Worthy . . . . .	80	12	15.	7.5	4	2	0
Rechabites . . . . .	116	19	16.3	3.7	3	7	8
Odd Fellows . . . . .	689	124	18.	4.	1	17	7
Female Rechabites . . . . .	30	6	20.	3.3	2	0	0
Foresters . . . . .	230	52	22.6	8.8	1	0	0
Ebenezer . . . . .	111	28	25.2	..	2	11	0
Catholic Beneficent . . . . .	167	51	30.6	10.	3	7	6
Ditto, Female . . . . .	80	25	31.2	9.	2	19	3
Perseverance. . . . .	58	20	34.4	6.1	1	13	10
	1645	344	20.9		2	7	11

The rate of sickness may be drawn with a prospect of a near approximation to the truth from a consideration of the rate of mortality in various dispensaries. Out of 26,217 persons admitted into the Preston dispensaries during the last 10 years, there have been 1,465 deaths, being 1 in 18. Out of 324,041 cases (excluding slight accidents) admitted into the Manchester Medical Institutions during 12 years there have been 11,587 deaths, that is about 28 cases of sickness to one death.

I am inclined to take the latter, which is under the average of Preston, Ashton, and Rochdale, as the most fair number to represent the proportion between cases of sickness and cases of death; and the average duration of each case of sickness in round numbers I take to be at three weeks, being about the average of the following returns:—

	Duration of Sickness.
Ashton (Boards) . . . . .	10 days
Preston (Sick Clubs) . . . . .	42 „
Rochdale (Dispensaries) . . . . .	19 „
Factory Returns . . . . .	17 „
Bolton . . . . .	23 „
Average duration of sickness . . . . .	22 „

According to the preceding data, which are probably very close ap-



proximations to the truth, there are every year in Lancashire 1,252,412 cases of sickness, each case being of three weeks' duration.

92. The pecuniary burdens entailed upon the community by the excessive amount of mortality and sickness are much greater than has hitherto been conceived. I refer to this, not as a main point in the inquiry, but as incidentally illustrative of some of the great evils resulting from the remediable causes of disease. A human being is not a mere producer of wealth; his death or existence, his happiness or misery, are much too high objects upon which to set a pecuniary value; but, when we are calling upon a commercial community to expend large sums for the removal of the causes of disease, it is important to show them that all which they expend in the promotion of this most important object is capital, upon which an enormous interest will be repaid by the diminution in the cases of sickness and of mortality, and in the economy of skilful productive labour.

In endeavouring to calculate the expenses incident to the present excessive amount of deaths and cases of sickness in Lancashire, I do so with the express object of showing those who must bear the expenses of improvement, that every step towards that improvement is a step to a large economy; although I do not in any degree rest the claims to improvement on any pecuniary grounds. In the construction of the following table, there is no pretension to absolute accuracy; for this cannot be obtained under the present system of registration; it is offered as a mere approximation, which is probably considerably below the truth. In this estimate I have proceeded on the following data:—

1. Ulverstone is taken as a district in Lancashire, in which the mortality and value of life are most nearly in a normal state, and the loss of life is estimated for every other district in this county on this assumed standard (see table in § 90,) which possesses an average age at death of 41 years, the Carlisle standard being 38 years.

2. The *excess* in number of cases of sickness is obtained by multiplying the *excess* of deaths in each district by 28, for reasons stated in § 91. The cost of each case of sickness, from loss of labour to the person sick, or, in the case of a child, to the adult attendant, and from cost of medicine and other incidental expenses, is taken at 1s. per day, or at 1*l.* on the duration of the case, (§ 91); although the actual cost, according to the returns of 11 sick clubs is, 2*l.* 12*s.* 5*d.*

3. The cost of the *excess* of funerals is taken at 5*l.*, including both adults and infants, although the returns of 232 burial-clubs make the average 8*l.* 12*s.*

4. The money value of adult productive labour, either to the community or to the persons dependent upon the adult for support, is taken as low as 10*s.* per week for each individual dying. All the adults dying lose the number of years indicated in the Table, and therefore this item is calculated on the total deaths of adults, and not upon the excess of deaths as with the other items. When it is considered that 13 years is the legal age for working in Lancashire, and that the adults, whose productive labour is estimated at 10*s.* per week, are all above 20, the assumed price of labour must appear very low.

5. The mean age at death to the mean duration of life has been favourably assumed as equal, whereas the co-efficient, instead of unity, should be between 1·2 and 1·4, the latter being on the average of England and Wales.

On these data the Table is constructed, and it is submitted that, in every instance, they are considerably *below* the truth.

## Excess in Loss of Life, beyond that of ULVERSTONE, in the under-mentioned Districts.

REGISTRATION DISTRICTS.	Excess in Number of			Proportion per Cent. of Deaths to Births under 5 Years.	Year's Loss of Life to		Total Loss of Money Value of Productive Adult Labour at 10s per Week to each Individual.	Total Loss on the Year's Deaths to the District in				Approximate Proportion of Life lost by each Pers. n.	Re-Marriages in 100 Marriages.		
	All Deaths.	Deaths of Adults.	Births.		Every Individual.	Every Adult.		Excess in Cases of Sickness at £1 per Case.	Excess in Funerals at £5 per Funeral.	Labour.	Total.		Widow-ers.	Widow.	Mean.
Liverpool . . . . .	3,611	2,063	504	51.	Y. M. 21 3	Y. M. 12 6	£ 325	101,108	18,055	953,225	1,072,388	$\frac{1}{2}+$	14.99	13.55	14.27
West Derby . . . . .	634	620	196	36.6	20 8	10 5	272	17,752	3,170	227,664	248,586	$\frac{1}{2}$	13.60	9.62	11.61
Ormskirk . . . . .	69	156	80	22.4	14 5	3 9	97	1,932	345	29,100	31,377	$\frac{1}{3}$	11.76	13.07	12.42
Fylde, Garstang, and Clitheroe . . . . .	11	116	..	19.7	7 11	4 5	115	308	55	64,170	64,533	$\frac{1}{4}$	10.79	6.12	8.46
Lancaster . . . . .	129	49	..	19.5	8 2	7 6	195	3,612	645	86,580	90,837	$\frac{1}{3}$	10.55	10.55	10.55
Burnley . . . . .	286	339	193	29.6	19 7	10 1	262	8,008	1,430	127,332	136,770	$\frac{1}{2}$	14.14	5.30	9.72
Todmorden and Has- lingden . . . . .	213	325	423	22.3	15 9	7 8	199	5,964	1,065	133,728	140,757	$\frac{2}{5}$	13.59	7.77	10.68
Blackburn . . . . .	364	414	509	27.	18 2	9 2	238	10,192	1,820	168,980	180,992	$\frac{4}{9}$	11.46	7.94	9.70
Preston . . . . .	661	569	307	34.1	19 8	8 9	227	18,508	3,305	175,925	197,733	$\frac{1}{2}$	13.82	7.89	10.86
Chorley . . . . .	138	180	158	29.4	16 10	9 3	240	3,864	690	87,840	92,394	$\frac{4}{9}$	11.73	7.26	9.50
Rochdale . . . . .	346	362	330	27.9	18 6	9 3	240	9,688	1,730	138,720	150,138	$\frac{4}{9}$	11.71	8.92	10.32
Bury . . . . .	693	499	372	34.2	20 8	11 4	295	19,404	3,465	231,575	254,444	$\frac{1}{2}$	13.70	7.07	10.39
Bolton . . . . .	847	722	626	32.6	19 8	6 8	173	23,716	4,235	170,232	198,183	$\frac{1}{2}$	11.82	6.23	9.03
Wigan . . . . .	393	343	279	28.	15 10	6 9	175	11,004	1,965	120,925	133,894	$\frac{3}{8}$	13.47	8.63	11.05
Leigh and Prescot . . . . .	429	388	364	28.2	16 11	7 11	206	12,012	2,145	148,526	162,683	$\frac{2}{5}$	13.67	9.97	11.82
Warrington . . . . .	201	160	117	27.6	15 1	6 4	165	5,628	1,005	56,925	63,558	$\frac{3}{8}$	14.29	10.39	12.34
Chorlton and Worsley . . . . .	871	767	483	36.3	20 8	10 0	260	24,383	4,355	261,820	290,563	$\frac{1}{2}$	12.59	6.48	9.54
Manchester . . . . .	2,418	1,355	924	38.9	18 9	11 3	292	67,704	12,090	730,292	810,086	$\frac{4}{9}$	17.24	12.21	14.73
Salford . . . . .	729	553	732	34.3	21 0	11 1	288	20,412	3,645	216,864	240,921	$\frac{1}{2}$	17.95	7.69	12.82
Ashton . . . . .	1,205	1,189	975	31.	20 9	12 5	323	33,740	6,025	532,950	572,715	$\frac{1}{2}$	15.52	9.85	12.69
Ulverstone . . . . .	..	..	..	13.	..	..	..	..	..	..	..	-	4.83	6.21	5.52
Total . . . . .	14,248	11,169	7,577	..	..	..	..	398,944	71,240	4,663,373	5,133,557	-	..	..	..
Average . . . . .	..	..	..	33.4	19 0	10 1	262	..	..	..	..	$\frac{4}{9}$	14.55	10.34	12.44



The columns of marriages, reduced from the last valuable Report of the Registrar-General, are brought forward in support of the argument, that excessive mortality does not prevent the rapid increase of population. Mr. Chadwick was, I believe, the first to show that excessive mortality and pestilence do not retard the increase of population. The increase of population in unhealthy districts has been ascribed, in the preceding pages, principally to the inducements for early marriages. The proportion of re-marriages affords a capital test of the truth of this view, for it is obvious that the death of one of a married couple must take place at an early age if the relict again marries. The two extremes in Lancashire form powerful proofs of this position; the proportion of re-marriages to 100 marriages being only 5·52 in Ulverstone, the most healthy district, and as much as 14·27 in Liverpool, the most unhealthy district. In the 10 towns of Lancashire, in which the average age at death of adults is the highest, the proportion of re-marriages to 100 marriages is 10·41; and in the 11 towns, in which the average age at death of adults is the lowest, the proportion is as great as 12·99.

The table gives the general result, that there are every year in Lancashire 14,000 deaths and 398,000 cases of sickness which might be prevented, and that 11,000 of the deaths consist of adults engaged in productive labour. It further shows, that every individual in Lancashire loses 19 years, or nearly one-half of the proper term of his life, and that every adult loses more than 10 years of life, and from premature old age and sickness, much more than that period of working ability. Without taking into consideration the diminution of the physical and mental energies of the survivors from sickness, and other depressing causes; without estimating the loss from the substitution of young and inexperienced labour for that which is skilful and productive; without including the heavy burdens incident to the large amount of preventible widowhood and orphanage; without calculating the loss from the excess of births, resulting from the excess of deaths, or the cost of the maintenance of an infantile population, nearly one-half of which is swept off before it attains two years of age, and about 59 per cent. of which never become adult productive labourers; and with data in every case much below the truth,—I estimate the actual pecuniary burdens borne by the community in the support of removable disease and death in Lancashire alone at the annual sum of five million of pounds sterling. I would draw attention to the columns representing the numbers of preventible cases of death and sickness in Liverpool and Manchester, or in any other of the large towns, to show the immense amount of misery which might be saved by proper sanatory arrangements. I do not mean to say that any physical improvements will ever bring these large towns to the natural standard of Ulverstone; for, as I shall proceed to show, there are moral as well as physical causes of disease in operation in the production of this excessive mortality: still a vast amount may be done by physical improvements, which must be effected, let the cost be what it may.

The column of re-marriages, given in the 'District Table, shows an intimate connection between this class of marriages and excessive mortality. The premature loss of one member of a family enables the relict to re-marry; and, in this point of view, the centesimal proportion of re-marriages becomes a natural index of premature adult mortality.

The early death of the male parent in the class of operatives occasions, in almost every instance, a pecuniary burden upon the surviving relatives, or upon the public at large, part only of which is exhibited by the large amount of widowhood and orphanage dependent on the poor-rates. But the pecuniary loss to the community is only a small part of the evils resulting from the premature removal of the parent,—there is a wide array of evils in the back ground, which in time come forward to oppress a community whose neglect, in the first instance, was the cause of their production. The misery of surviving relatives, the dependence of those who should have been independent of public aid, the physical and mental deterioration of those who struggle with difficulty through the perils of childhood without aid from the public funds—are far more important considerations than the pecuniary burdens entailed by their existence. By adding together the third and the last columns of the following Table, for which I am indebted to the Poor Law Commissioners, it will be seen that there are in the Unions of Lancashire 8,258 widows and 12,338 children dependent upon public charity.

TABLE showing the Amount of ORPHANAGE and WIDOWHOOD dependent on the Poor-Rates in the County of Lancaster.

Names of Unions.	In the Union Workhouse (or Workhouses) on the 18th March, 1844.						Numbers of Widows receiving Out-Door Relief on 18th March, 1844.	Number of Children under 14 Years of Age dependent on them.
	Number of Orphan Chil- dren (i. e. having lost one or both Parents) under 14 Years of Age.			Children under 14 Years of Age who have been de- serted by their Parents.				
	Males.	Females.	Total.	Males.	Females.	Total.		
Ashton-under-Lyne.	Not in operation.							
Blackburn . . . .	29	10	39	15	24	39	217	563
Bolton . . . . .	28	10	38	14	4	18	230	631
Burnley . . . . .	6	4	10	4	4	8	385	474
Bury . . . . .	56	39	95	5	5	10	370	533
Chorley . . . . .	15	6	21	9	8	17	285	275
Chorlton . . . . .	34	22	56	3	3	6	112	385
Clitheroe . . . . .	13	2	15	4	..	4	115	303
Fylde, The . . . .	11	5	16	3	5	8	46	123
Garstang . . . . .	2	4	6	4	1	5	193	163
Haslingden . . . .	3	2	5	..	..	..	220	232
Lancaster . . . . .	3	10	13	11	6	17	86	220
Leigh . . . . .	32	7	39	6	3	9	81	232
Liverpool. . . . .	221	123	344	67	41	108	1,895	1,834
Manchester . . . .	42	7	49	14	9	23	1,609	1,235
Oldham . . . . .	Not in operation.							
Ormskirk . . . . .	23	23	46	2	3	5	97	329
Prescot . . . . .	21	17	38	5	1	6	137	387
Preston . . . . .	41	18	59	61	23	84	295	476
Rochdale . . . . .	Not in operation.							
Salford . . . . .	73	46	119	10	7	17	127	333
Todmorden . . . .	3	2	5	2	1	3	184	246
Ulverstone . . . .	10	3	13	1	2	3	76	195
Warrington . . . .	12	9	21	20	9	29	339	552
West Derby . . . .	54	37	91	3	12	15	516	826
Wigan. . . . .	24	19	43	11	13	24	643	610
Total . . . . .	756	425	1,181	274	184	458	8,258	11,157

I shall afterwards show that, even in Lancashire itself, the causes of excessive mortality have little reference to the poverty incident to distressed times; and this may be further illustrated by a contrast of the county of Wilts, in which the wages are perhaps the lowest, with this county of Lancaster, where they are perhaps the highest. In Wilts, the



proportion of deaths to the population, according to the returns of the Census Commissioners, is 1 in 49; while in Lancashire it is 1 in 36. The average age of deaths, judging from one year (1841), in Wilts, is 35 years and 4 months; whilst in Lancashire, in the same year, we have seen that it is only 22 years and 10 months. This great difference is mainly attributable to the large proportion of infantile deaths in Lancashire; so great that 17 per cent. of all the children born are swept off before they attain one year of age; while in Wilts only 11 per cent. are thus removed. Wilts, the low-waged county, is not exempt from epidemics, which amount to 16 per cent. of the total deaths; but in Lancashire, it was on the same year's experience 21 per cent.

The proportion of persons prematurely dying in the county of Lancaster, and the number annually carried off by epidemics, are much greater than in the agricultural counties, as will be seen by the following Table, calculated on every 10,000 of the population:—

Counties.	Number of Deaths to every 10,000 of the Population from			Total Number of Deaths to every 10,000 of the Population.	Total Number of Births to every 10,000 of the Population.
	Epidemic Diseases.	Diseases of the Respiratory Organs.	Between 20 and 60 Years of Age, or Prematurely Dying.		
Wilts . .	34	52	56	204.5	294.5
Westmoreland	23	47	49	206.9	285.6
Lancaster .	55	73	68	279.2	378.5
Devon . .	31	46	44	179.4	277.3

The difference produced by the operation of the physical causes of disease is rendered still more striking by comparing two districts in the same county, one of them (Ulverstone) being the highest in the scale of health, the other (Liverpool) being the lowest.

Unions in County of Lancaster.	Number of Deaths to every 10,000 of the Population from			Proportion per Cent. of Deaths under 5 Years to Births.
	Epidemic Diseases.	Diseases of the Respiratory Organs.	Between 20 and 60 Years of Age, or Prematurely Dying.	
Ulverstone . . . .	13	39	48	13
Liverpool . . . .	75	114	94	51

#### ADMINISTRATION OF OPIATES TO CHILDREN.

93. I have said that there are moral as well as physical causes of disease in Lancashire; and I now proceed to point out some of the most important of the former class. The first to which I would draw attention is one of a most serious character, because it is so universal in extent; and as some of the details with regard to it will appear incredible to those who are unacquainted with the habits of the poorer classes, I distinctly state at the outset, that all the evidence which I adduce on this subject has been read over and signed by the witnesses under examination, the attested copies of the evidence being already in the

possession of the Commission. I may add, that I have had much confirmatory evidence from other witnesses; but as the latter have not signed their names to the information given, I have thought it advisable to neglect, altogether, its consideration.

I allude to the practice of administering opiates to young children. The custom first originated, according to all concurrent evidence, in the frequency of disorders having their primary seat either in the stomach or bowels, arising partly from injudicious feeding and improper nursing, but principally from the irritability produced by their continued exposure to a polluted atmosphere, and other physical causes of disease. The children thus disordered were taken to unlicensed practitioners, who prescribed opiates as a general remedy, and their mothers mistook the soothing effects produced by narcotics for proofs of improvement, and themselves continued the practice. They soon discovered that the administration of narcotic drugs prevented restlessness in the child, enabling them to pursue their ordinary avocations; and thus a practice, often originating in disease, has become habitual, even in cases where disease did not exist. Druggists who vend such narcotic preparations speak as to the extent of their use; and their evidence is perhaps the more to be depended upon as it was their interest to diminish, rather than to exaggerate, the extent of the evil.

A. B., a respectable druggist in Manchester, whose customers are, however, entirely of the poorer class, gives the following evidence as to the extent of the practice in the district where he resides:—

“Are you well acquainted, as a druggist, with the habits of the poorer classes in your neighbourhood?—I know their habits very well.”

“Are they much in the habit of using drugs for their children to ensure quietness or sleep?—Of the really poorer classes, I may safely say, that there is scarcely a single family in which this practice does not prevail. The way it is done is this: the mother goes out to her work in the morning, leaving her child in charge either of a woman who cannot be troubled with it, or with another child of perhaps 10 years old. A dose of ‘quietness’ is, therefore, given to the child to prevent it being troublesome. The child thus drugged sleeps, and may waken at dinner-time; so, when the mother goes out again, the child receives another dose. Well, the mother and father come home at night quite fatigued, and as they must rise early to begin work for the day, they must have sleep undisturbed by the child; so it is again drugged, and in this manner young children are often drugged three times in each day.”

The druggist is probably right, as far as regards his own district, for he says: “*I sell in retail alone about five gallons per week of ‘quietness,’ and half a gallon of ‘Godfrey,’*” the former preparation being so strong as to contain 100 drops of laudanum in an ounce; a single teaspoonful is the prescribed dose; so that, allowing one ounce weekly to each family, this one druggist supplies 700 families every week.

Another druggist in the same district confirms the statement with regard to the prevalent use of these opiates, saying, “Almost all the families of the poor are in the habitual use of these opiates—the English more than the Irish, who have a dread of them.” He also has a right to assert this from his own experience; for although not living many hundred yards from the last witness, his sale of “sleeping-stuffs” amounts to “three or four gallons weekly,” as shown in the following evidence:—



" These preparations are administered in the form of cordials, made with opium, with the addition of sugar and water. Laudanum is also used, in fact, more than ' Godfrey.' There is no dread of laudanum now, as there once was; so 10 drops are given at a time: it is given neat, or mixed with a little sugar and water, by the poor people themselves. On this account ' Godfrey' is getting out of use. Including all the preparations, we sell about three or four gallons per week of sleeping stuffs. ' Quietness' used to be bought a good deal; but laudanum being cheaper, and going further, is now substituted."

" There is no dread of laudanum now, as there once was," says the druggist; so the poor people use it for their children freely and indiscriminately; but the physician advises very differently:—

" Opiates have generally been exhibited (in a very uncertain dose) in the forms of laudanum, syrup of white poppy, or under some empirical title, as ' Godfrey's Cordial,' or ' Dalby's Carminative.' The object of such medicines has been chiefly to allay pain by producing sleep. These medicines have been ignorantly and indiscriminately given, (and in some instances under the sanction of medical men,) either because they did not themselves know what to do, or to fall in with the desires or prejudices of parents and friends. But the administration of this class of medicines requires the greatest skill in the physician. Nothing is more uncertain than the effects of opium on young subjects; and it ought never to be employed even by medical men, except with the greatest caution, as it sometimes acts with much violence, and has proved deleterious even in very small doses. Half a drachm of genuine syrup of white poppy, and, in some instances, a few drops of ' Dalby's Carminative' has proved fatal in the course of a few hours to very young infants."\*

That unhappily there "is no dread" is confirmed by the testimony of a third druggist, residing also in the same district, who states his sale of narcotic mixture to be one gallon weekly.

" Do mothers ever purchase laudanum instead of ' quietness?' Yes, pure laudanum is often used for the same purpose. The usual dose given to produce sleep in a restless child is eight drops, and this being, like the other, gradually increased to three doses a day, amount to 24 drops."

Thus we have *three* druggists, all of acknowledged respectability, in one district of Manchester, selling respectively five and a half, three and a half, and one—in all, nine gallons weekly; two of them testifying that "almost all the families" of the poor in that district habitually drug their children with opiates: and the third, after a lengthened examination of all the customers who attended a pawnbroker's shop, kept by a relation of his own, giving as a statistical result, that five out of six families in his district were in the habitual use of narcotics for children.

This, however, was the district in which I found the practice to be much the most prevalent. In St. George's district, one druggist, who kept a grocery shop in addition to that for medicines, ascertained that one family in ten of the poor habitually used narcotics for their children; his own sale, exclusive of laudanum for extemporaneous mixtures, was one gallon per month. Mr. Ransome, one of the principal surgeons in Manchester, and who was present during the examination of the pre-

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\* " Commentaries on some of the most important Diseases of Children," by John Clarke, M.D. Part I. London, 1815. P. 31.

vious witnesses, at my request examined the mothers of children who were brought as gratis patients to his surgery, and out of 47 children under seven years of age, 22, or nearly one-half, were found to have taken these empirical preparations of opium.

The evidence of druggists, as to the prevalence of this custom, is amply confirmed by all medical men who have had an opportunity of becoming acquainted with the practice. Mr. Heath, one of the surgeons to the Manchester workhouse, says, "I have ascertained, from my practice among the poor, that the custom of administering narcotic drugs to children is very prevalent." Mr. Robertson, in his Report contained in the Appendix, considers that the difference in the ratios of infantile mortality, in various districts in Manchester, may be partly attributed "to the indiscriminate administration of opiates to sick children." Mr. Booth, surgeon to the Hulme Dispensary, knows the custom to be very prevalent, and considers "the intention is to ensure quietness during the night, when the parents come home from the factory; or they are given by nurses during the parents' absence at the factory." Mr. Noble, one of the surgeons under the New Poor Law, is aware "that the practice is very general among all the classes of the poor." Mr. Leigh, a surgeon and registrar of deaths in Deansgate, is convinced that "the exhibition of narcotics, more particularly opiates, to children of tender age, is practised among the poor in Manchester to a frightful extent." And Mr. Bennett, a surgeon and registrar of deaths in Ancoats district, has ascertained, from an observation of nine years, "that the practice of administering opiates or other narcotic drugs prevails to a fearful extent."

Similar evidence as to the prevalence of the custom is given by druggists in all the towns visited. In Wigan, four druggists examined agree in describing the practice as "very prevalent among the lower orders," and in stating that it appears "to prevail with all those who have occupations in factories, workshops, and other places at a distance from home, which oblige mothers to leave their children the whole or greatest part of the day." One of these druggists sold nearly two gallons of opiates every week; another sold one gallon per week, and a third two quarts per week.

In Rochdale similar evidence is given by two druggists. A. B. is indignant at the assertion that the practice prevails to a *great extent* in Rochdale, stating, as the result of his inquiries, that "out of ten families of the operatives, *not more than six* are in the habitual use of opiates;" while another druggist, who also had abundant opportunities of knowing the custom, considers "that one-third of the working people used these sleeping-stuffs."

In Bury, a druggist, resident for 20 years in that town, stated that "almost all the factory class use these cordials for their children, and many of the families of other operatives." And Mr. Fletcher, the oldest surgeon in that town, says, "that two-thirds of the labouring class generally, and nearly all the factory class, are in the habit of using these drugs."

Mr. Brown, surgeon, of Preston, obtained returns from the principal druggists of that town, by which it appears that upwards of 1600 families, or about one-fifth of the working population, are known to be in the habitual use of narcotic drugs for children, allowing half an



ounce per week for each family; this I conceive to be the closest approximation to the truth obtained during the inquiry.

Mr. Whitehead, the registrar for Ashton-under-Lyne, gives similar evidence with regard to his town; he says—

“I conceive that the practice of administering opiates to children is very prevalent among the working classes, and I think more particularly when there are natural children born and left in charge of the keepers of houses where the mothers lodge, while the latter are working in the mill. In going to register deaths, I have frequently remarked children looking very ill, and on observing this to the neighbours, they have said, ‘It is no wonder that they are so—they are slept to death;’ meaning, that sleeping stuffs are given to them.”

Mr. Coulthart, in reporting to me on the state of that town, devoted much time to the examination of the practice of administering opiates to children, and comes to the conclusion, “that at least one-half of all the children in the town are drugged with these deleterious medicines;” finding, from returns made to him by 15 vendors, that they sold 6 gallons  $2\frac{1}{2}$  quarts weekly.

In Bolton I found the practice to prevail to a considerable extent, the sale of opiates not being confined to druggists, but as the information given to me in that town was not attested by the signatures of the parties I shall not adduce it.

The Health Committee of the Town Council of Liverpool obtained evidence of the existence of the practice in that town, but more particularly of the administration of spirituous liquors, which are more commonly used than opiates by the Irish. The numerous points demanding attention in Liverpool prevented me entering into any special inquiry on this subject; but I know of no reason to suppose that the practice is less prevalent in that town than in the other towns named.

The custom of administering opiates to children has extended to the small as well as to the large towns of Lancashire. Thus in the small town of Clitheroe, the population of which amounting to 6765, consisting partly of calico printers and partly of factory operatives, I found a weekly sale of four pints of Godfrey’s cordial, and an annual sale of 4000 poppy heads, for making “sleeping tea for children.” One druggist describes these drugs as being sold “to an alarming extent among the factory population: not so much so among printers.” Another describes the sale “as *decent* for the size of the town, although it was larger at Colne, where I served my apprenticeship.”

94. The preceding evidence is convincing as to the universality of this mischievous practice among the poorer classes in Lancashire; and, unfortunately, the evidence is equally conclusive as to the continued increase of the evil. A. B., the druggist in Manchester, who sells  $5\frac{1}{2}$  gallons per week of opiates, gives the following evidence with regard to the increase of the custom:—

“Do you consider that the practice is on the decrease?”

“Quite the contrary: I am sure it is very much on the increase; and it is now finding its way into the middling classes.

“It has been alleged that the sale of opium and laudanum has been much increased since the temperance movement, do you know this to be the case?”

"No, the sale has decreased among adults of late years, owing, I think to the distress of the times."

C. D., who sells  $3\frac{1}{2}$  gallons of opiates weekly, is also of the same opinion.

"Do you consider the practice of drugging children with opiates to be on the increase or decrease?"

"It is decidedly on the increase with us. The practice of giving cordials is decreasing; but that is owing to the great increase in buying pure laudanum for the same purpose."

The evidence given by the last witness is one of the most alarming symptoms of the increase, and is verified by other witnesses, who ascribe any diminution which they may experience in the sale of cordials to the use of pure laudanum or opium, or their preparation into extemporaneous mixtures: B. C., of Rochdale, says:—

"From my own sale, I would say that the practice was on the decrease in Rochdale. But this diminution in the sale of cordial may be owing to a habit into which the poor people have got of buying at a time a pennyworth of solid opium, and a pennyworth each of anise and carraway seeds; these they boil with sugar and treacle, and dose the children with the mixture. That practice is becoming prevalent. I know some instances where overdoses have been given of these home-prepared drugs; and I have seen children in a dangerous state after their use."

In only one instance, that of Wigan, was there an alleged decrease in the custom; and the cause of the decrease was ascribed to the circumstance of the wives of colliers remaining at home to tend their children.

A. B., a druggist in Wigan, is asked—

"Is the sale of such cordials on the increase?"

"In this town it is decidedly on the decrease, and has been so for some months. I attribute this decrease to the operation of the Bill which prevents women working in coal-pits; so that now, as they have to remain at home, the sleeping stuffs are unnecessary. The great cause of their use is to make children sleep when their mothers are at work. I sell about one gallon per week for this purpose."

B. C., another druggist in Wigan, is also sensible of a decided decrease in his sale, but had not considered the cause of the diminution.

"Are narcotic drugs extensively administered to the children of the poorer classes in Wigan? and is this practice on the increase or decrease?"

"Preparations containing laudanum or opium are much used by the lower orders in this town; but within this last six or seven months, from some cause or another, the sale has decreased."

"That, in fact, is since the introduction of Lord Ashley's Bill for preventing women from working in coal-pits. Do you consider the reduction in the demand for opiates due to the operation of this Bill?"

"It may be so, but this did not strike me before; but I certainly find that now two quarts of the cordial will serve me for a month."

F. G., who sells, "in small quantities, about a quart a-day," dissents from the assertion as to the decrease, for "he does not perceive any diminution in the use of it since women ceased working in coal-mines; nor was he aware that opiates were more used amongst them than in any other class of operatives." He considers the consumption of Godfrey's Cordial, as prepared by him, to be "on the increase rather than otherwise."



There is certainly no obstacle to the increase of the custom by distaste on the part of the children, for the drug is sweetened, so as to render it palatable; and many are the instances of infantile precocity related, in which a child can point out the bottle of Godfrey on the shelf of the druggist. How melancholy the following statement of a druggist:—"It is curious to see the children in the shop; they stretch out their little hands, for they know the bottle, and when they get it, drink it as eagerly as the drunkard does his glass!" And equally deplorable is the description of another druggist, who says,—“I have seen the little children in the shop put the neck of the bottles in their mouths and bite the cork, so fond are they of the preparation; for coming to the shops so often, they know the bottle!”

The druggists who give this evidence are respectable men—in all common dealings of life, humane men,—but custom has rendered them indifferent to the fearful consequences arising from this practice. They are not ignorant of the great evils, but they have been accustomed to view them with a business eye. Take the following description given by a druggist of the children drugged at his own shop:—

“Have these children any peculiarities of appearance?”

“You may know at once a child who is accustomed to the use of these drugs. It becomes so thin that you feel nothing but bone. Its eyes get sunken and fixed—its nose pinched; in fact such children look exactly like little old wizened men and women. They sink off in a decline and die. I have often reprobated the practice to mothers; but their answer is, ‘What are we to do, it is so very cross?’”

It is difficult to write calmly upon facts such as these, but it is only by a calm consideration of the evils that a remedy can be obtained. Another druggist, selling his gallons of opiates weekly, thus describes their effects:—

“Have you ever known instances in which children have suffered by excessive doses being administered by mothers or nurses?”

“Oh, yes! I have known death ensue, and also sleeping for a considerable length of time, so that there was difficulty in getting the child out of the sleep. The deaths in the cases to which I allude arose from sudden convulsions.

“Have the children in the habitual use of such opiates any peculiarities of appearance?”

“They look very drowsy and low, and seem to be always sleepy. Their eyes are fixed. They become emaciated; their bellies protuberant; and they look very old.”

Convulsions, of course, are frequent from the use of opiates; nor are the mothers of children ignorant of their effect, as we are told by a Rochdale druggist—

“It has been stated that you have a sleeping cordial in high repute among the poorer classes; is this the case?”

“It is a very good cordial, for it does not produce the convulsive effects that other Godfrey’s cordials do.

“How do you know that?”

“Because mothers often come to me, and say, ‘Mr. ———, we want more of your Godfrey, for it does not produce convulsions in our children, like some of the other Godfreys.’”

Strange it is, that men acquainted with these great evils should foster and encourage them, and not see that they, as well as the mothers,

are in fault. Thus an apothecary in Salford, and a "surgeon" in Wigan, who keeps also a druggist's shop, both of whom wrote me a letter on the subject, continue their sale of opiates, and yet the former states from his own experience as follows:—

"The effects upon the system are a general emaciation of the whole body, and constipated bowels. Inflammatory diseases in such subjects are more difficult to overcome, and various other complaints attendant upon children.

"I feel fully persuaded that, could the evil be dispensed with, many lives would be saved, and we should have a more able-bodied set of people."

The surgeon and druggist in his letter "believes great injury and loss of life are the too frequent results of the indiscriminate and habitual use of these opiate medicines," although at the same time he "certifies that he is in the habit of selling various preparations of opium under the forms of infants' mixture, Godfrey's cordial, paregoric elixirs, and laudanum; also, crude opium, combined with other substances, according to popular recipes."

The description given by druggists coincides with the observations of medical men, who meet with cases in their own practice. Mr. Bennett, a surgeon and registrar of deaths in Ancoats (a district in Manchester), who has paid much attention to this subject, says:—

"The general appearance of a child accustomed to opiates, &c., is peculiar, and such as a practised eye could scarcely mistake; to be more definite, I should expect such a one to present something like the following appearance: the head looks large, the countenance is aged, anxious, unpleasant; the child is generally brought in a state of torpor, or perhaps more frequently particularly restless, it seems to suspect every one, and shrinks from observation. The skin is dull, often also it has upon it a clammy perspiration. The limbs are emaciated, showing a want of muscle, the joints consequently appear large, the belly is swollen as though filled with air, the bowels alternate between a state of costiveness and relax."

Nor are the effects thus described surprising, when we are acquainted with the enormous doses, to which the children become gradually accustomed. One druggist states that he formerly sold much "Godfrey's cordial," but that now the preparation most in vogue is "quietness;" and he is asked—

"Why is 'quietness' preferred to 'Godfrey'?—Because it is the strongest. I am sure that if I put double the quantity of laudanum into it than it now contains I could sell twice as much as I do at present, until some other druggist did the same. A child begins with 'Godfrey,' the dose is gradually increased, and this being found to be expensive in large doses, the mother then comes to 'quietness;' at last even that is found not to do, so she buys laudanum to put into it. I am often asked to add some drops of laudanum to the cordial in my own shop, but of course I refuse to do so.

"Are your customers for this drug regular or incidental?—The families accustomed to it never do without it, and they come regularly, often for a pennyworth every day (half an ounce is sold for a penny).

"Do I understand you to say that the half ounce is given to a child in one day; for, according to the strength described, the half ounce contains at least 50 drops of laudanum?—I can assure you it is the case. The first dose is a small tea-spoonful, then it is gradually increased, and the children habituated to it take the whole half ounce in the course of the day."\*

\* In one case a druggist stated that he knew children who took 100 drops of laudanum during the day.



He is confirmed in this account by other druggists, one of whom is asked—

“Are the doses of these narcotic drugs increased when the child becomes habituated to their use?—Yes, they are; at first the child gets three or four drops of laudanum, and then the dose is increased to about 20 drops by the time it gets 12 months old; and when it gets still more accustomed to it, more than that is given. I have known a tea-spoonful of laudanum given at one dose to a child. We have many customers who scarcely miss a day in coming for a pennyworth of cordial—that is, for half an ounce. When they buy laudanum, they will come twice in the week for it, buying one pennyworth or one drachm each time.”

A third druggist gives the following account:—

“The first dose given to a young child is about a tea-spoonful per day, but as it soon becomes accustomed to this quantity, the dose is increased gradually until it frequently amounts to about three tea-spoonfuls. Many families give one pennyworth, or half an ounce, daily to a child: some two-pence worth or one ounce. In fact I have seen that when a child has been sent for half an ounce of the cordial, it could not resist the temptation of drinking it until the whole was consumed before reaching home, so that the mothers were obliged to come for it themselves. This of course is one of the elder children, as it cannot apply to the infants, to which it is usually given.”

A fourth druggist from Preston, states that—

“The people who are in the habit of giving their children these drugs generally begin to administer them when the child is only three or four weeks old, and in many instances younger, continuing to give it to them every night until the child is so habituated that it has little effect as a narcotic, which induces the mother to give it a double dose, until at last some children will take six drachms a-day to produce the same effect as half a drachm did when they first began to take it. The children who take it regularly look very sickly and stunted in their growth. I have seen a child 15 months old not larger than one 3 months.”

95. The opinions of druggists, as to the effects produced, are of importance, as showing the results of their daily observation; but they become still more important when confirmed by the testimony of physicians and surgeons in the various districts examined. Medical witnesses describe undoubted cases of sudden death which have occurred in their own experience from the indiscriminate use of these opiates. Thus Mr. Heath, one of the surgeons to the Union Hospital of Manchester, is asked—

“Have you ever observed any injurious effects arising from the custom of giving narcotics to children?—I have seen emaciation, *tabes mesenterica*, and convulsions, produced by the improper administration of these drugs. I recollect an instance just now, in which a mother gave ‘quietness’ to her child: it was seized with convulsions, and I was called in as medical attendant; but the child died a few hours after the exhibition of the dose. The dose in this case was given in order to keep the child quiet when it was restless.

“From your experience, do you consider that the improper use of these opiates occasions a considerable infantile mortality in this town?—I am certain that it does so.”

Mr. Noble, one of the surgeons under the Poor Law, adduces a case which he was recently called to attend:—

“What influence have these drugs on the general health of the child?—

They act destructively on all the vital functions, generally leading to a premature mortality by the induction of *tabes mesenterica*, a disease evidenced by emaciation, withered and sallow skin, tumid abdomen, and general diarrhœa, with voracious appetite.

"Have you ever been called, in your professional capacity, to attend a case of sudden death occasioned by an over-dose of these drugs?—A short time ago I was summoned to visit a child only a few weeks old. The mother had given the child some narcotic drug, which she had procured from a neighbouring druggist, and it died within half an hour of my visit, with all the usual symptoms of poisoning by opium.

"Did this case go before the coroner?—No, the idea never arose; sudden death in infants is too common a circumstance to be brought before the attention of the coroner; and medical men, in such circumstances of death arising from ignorance or carelessness, and not from criminal intention, do not like to proceed to such extremity.

"Are you of opinion that the use of narcotic drugs for the purposes you have mentioned is a cause of considerable mortality?—As an indirect or predisposing cause, I feel no doubt of the fact."

Mr. Bennett, the registrar of deaths in Ancoats, who, I have already stated, has long paid attention to this custom, describes a case of death which occurred in his own practice, and ascribes a large amount of infantile mortality to the direct or indirect effects of narcotics:—

"Have you ever observed cases of sudden death arising from the improper administration of such drugs?—Yes, I feel assured I have witnessed several cases where death has occurred within a few days; one, however, which took place within the last two months, I will mention. I was called upon to attend a child about half-past 11, P.M.; on arriving, I found it in a state of collapse, limbs flaccid, &c. I asked what it had had given to it? The mother immediately exclaimed, 'Oh! I have killed my child!' She afterwards stated that she had given to it a tea-spoonful of Godfrey, which she had obtained from a druggist. The child died early the following morning; up to that time it had not had any medical attendance, nor had it taken any medicine. A female attended the mother. The child's age was about month.

"Did the case to which you allude go before the coroner?—The coroner did not think it requisite to hold an inquest in the case mentioned.

"Are you of opinion that this injurious practice is a cause of great infantile mortality in this town?—Yes, necessarily so, provided I am correct in my previous replies, of which I have no doubt. I speak more particularly as regards my own district. I do consider that the administration of such drugs will predispose to such diseases as *tabes mesenterica*, *marasmus*, debility, &c. Further, I am of opinion that a large proportion of the deaths registered '*convulsions*,' may be attributed to the same cause, with this difference, that I think many of them may be said to arise immediately, death taking place, as I have before mentioned, in a few days. Excessive infantile mortality is a matter of course."

Mr. Leigh, a surgeon and registrar of deaths in Deansgate, Manchester, has the credit of having drawn public attention to this subject several years since, and now gives evidence with the augmented force of increased experience:—

"Have you reason to apprehend that the administration of narcotic drugs to children, forms a predisposing cause for many forms of infantile disease, so peculiarly prevalent in this town and in other parts of Lancashire?—I am of opinion that narcotics exhibited to young children in the manner often practised here frequently produce such a degree of venous congestion in the



brain as to cause death directly under a form of apoplexy. I believe that the constant exhibition of narcotics in very early life induces such a state of congestion in the brain as renders the little subject particularly prone under any unusual irritation, such as that which occurs in dentition, &c., and that many of the vast number of deaths from convulsions, are fairly attributable to this practice. I consider also that by the continued administration of opiates the mesenteric glands become diseased, the lacteals become torpid, and their absorbent power impaired, the mucous surfaces of the stomach and small intestines acquire an unhealthy condition, and the power of assimilation of nutriment is thus checked, so that the state of wasting and emaciation so often observed in the children of the poor becomes a natural consequence, and frequently terminates in death. I have reason to believe that many of the cases of deaths registered under the terms *marasmus*, *tabes mesenterica*, and by non-medical registrars 'wasting,' and 'consumption,' are due to the long-continued administration of these destroyers of infantile life."

Mr. Booth, who has been ten years surgeon to a dispensary in a district containing 30,000 persons, principally workers in factories, states that he can confirm Mr. Leigh's evidence from his own experience. He is also clearly of opinion that a considerable amount of infantile mortality is due to the exhibition of narcotics, stating that he himself has seen cases of sudden death in the form of convulsions from this cause.

Mr. Fletcher, a surgeon in extensive practice in Bury, and who has been engaged in his professional duties for 20 years in that town, expresses himself very strongly on the injurious effects arising from the custom:—

"Have you known injurious effects to arise from the use of these drugs? —Yes, very frequently. They produce convulsions, which, if they do not prove fatal at once, terminate in chronic hydrocephalus. Emaciation is also produced, and the child often sinks from debility without any other marked disease, except that it acquires a strange aspect, its eyes become fixed in a stare, and a general torpidity of nervous action is apparent. I have also often seen diseases of the mesenteric gland arise from the use of these drugs. In a great many cases of infantile fever and acute hydrocephalus, I have found, on inquiry, that the mothers of the patients were in the habit of administering narcotic drugs, and I have no doubt that these were the predisposing causes of the disease.

"Do you consider that this injurious practice contributes much to the excessive mortality of the children in this district? I am decidedly of opinion that their use is a great cause of mortality among children generally. In this town I have frequently thought of informing the coroner of deaths which I knew to be caused by an excessive use of these drugs; but the practice is so very general that little impression could be made by doing so."

All the medical men whose opinions I have taken on this subject are convinced of the prevalence of the custom, and of its injurious effects; but I cite only the evidence of those who have devoted to it specific attention.

96. All the witnesses are agreed, that the evil does not end with the death of those who fall victims to the horrible practice, for the mental and physical capabilities of the survivors are materially impaired, their constitutions are often irretrievably ruined, and instances have been brought before me in which idiotcy and insanity have certainly followed as the result of the practice.

97. I have said, and I distinctly repeat the conclusion to which I have been led by laborious inquiry, that the custom of administering

narcotics to children originated primarily in, and is upheld by, the physical causes of disease acting upon the younger portion of the community. On the removal of these causes, the general inducement to the continuance of the system would cease, for the irritability and difficulty of management of children would diminish with their increased health.

98. Mothers pursue this inconsiderate and fatal practice partly with knowledge of the consequences, but often in ignorance, as is shown by its decrease when any fatal case has drawn public attention to the custom. A death, occurring in a rank of life higher than that in which deaths from the same cause usually occur, created considerable attention, and produced the effect described by a druggist in Clithero, where the circumstance occurred.\*

“Is the practice on the increase or decrease? I can scarcely tell whether the practice is on the increase or decrease. Some time ago there was a child of —— poisoned by an overdose of a narcotic preparation, upon which the sale diminished greatly, but it is now increasing again.”

This instance offers the gratifying prospect that the practice will decrease, when the public become more fully aware of the great evils attendant on it.

A verification, by licensed medical practitioners, of the alleged causes of death, would contribute greatly to this end, and the appointment of Officers of Health with duties, such as those proposed in Mr. Chadwick's Report on Interments, would do more to suppress this evil than any other measure of which I am aware. It is an evil not confined to factory districts, as some have alleged, for the recent trials in Wales have shown it to be very prevalent in rural districts; and numerous inquiries in small towns in agricultural counties have convinced me of its existence there, though to a much less extent. The diffusion of knowledge, and, above all, the removal of the physical causes of disease, will go far to check this great evil.

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#### MORAL CAUSES OF DISEASE.

99. In the preceding part of the Report, I have endeavoured to point out the principal causes of disease and mortality, so far as we are authorized to examine them by our commission. There are many other minor causes without the province of our inquiry, and of these none are more injurious than the ignorance of domestic economy among the poorer classes. This ignorance certainly leads to much disease among the infantile part of the population, and is strongly insisted upon by various medical witnesses. Dr. Strange of Ashton, has devoted

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\* It appeared on inquiry into this case, that the child had occasionally received doses of “Godfrey's cordial” when ill. On one occasion it received the same dose as formerly, but died from the effects; and it was proved before the coroner that the druggist had bought the cordial from a person from whom he had not procured his previous supply, and that this new “cordial” was considerably stronger than that sold by him on previous occasions. In the last Report of the Registrar-General, 39 deaths are registered as *acknowledged* cases of poisoning by the administration of an overdose of opiates.



great attention to the consideration of the infantile mortality in that town, and with reference to the ignorance of domestic duties, states as follows:—

“ It is no uncommon thing to meet with married females at 15, and they are frequently mothers at 17, the fathers being but little older. But even though marriages should not take place before the age of 20 or 21, the constitutions of factory girls are not sufficiently consolidated, nor their frames firm enough at that age to bear strong and well-constituted children; to say nothing of the deleterious effects such early child-bearing must have upon the tender frames of the mothers, whose whole configuration and appearance is that of large children. To increase the bearing of this cause upon the mortality of children in manufacturing districts, comes the fact, that in two, three, or four weeks after delivery the young mother, if she have but one, two, or three children, returns to her work in the mills, leaving the charge of her children either to some old woman or young girl, or puts them out to nurse.

“ The effects of this unnatural treatment are visible upon the infant in a very short time. A child, born apparently strong and healthy, may almost always be known two or three months after birth if it belong to a mother who goes to the factory. Instead of being plump and growing, it is almost invariably emaciated and less than at birth, commonly wasted by continued diarrhœa, brought on by the manner of its diet. The mother suckles it but at meal times and at night: the milk, having been so long secreted, is too stimulating for the child; and the quantity and kind of the succedaneous food adds to the irritation.

“ The greatest ignorance prevails as to the organization and requirements of a child as regards diet. It is no uncommon thing to be consulted for emaciated children with extensive mesenteric disease, and, on inquiry, to find that the food consists in great part of bacon, fried meat, and fatty potatoes, when the infant has not perhaps two teeth in each jaw to masticate it.

“ I am convinced of the great bearing of these facts upon the mortality of children, from the circumstance that a greater proportional number of first and second, and (particularly) illegitimate children die before they attain five years of age than of children born after the mother has relinquished her factory employment.”

I have already stated that the returns of nearly 3000 married men in factories gave the low average age at marriage of 23; and as the women are in most instances younger, neither party can have much experience of domestic matters, especially when combined with much general ignorance. Mr. Coulthart has shown, with regard to Ashton-under-Lyne—

“ That 80 years ago 54 males and 17 females out of every 100 couples married wrote their names, whilst in these days of ‘popular knowledge,’ it appears by the same parish registrars, that only 12 men and 8 women out of the same number are capable of recording their names with letters.”\*

If this statement, drawn up from the experience of 1980 persons married in the parish church of that town, from 1838 to 1843, be at all a correct index of the state of knowledge of operatives in other parts of Lancashire, we cannot be astonished at the ignorance of domestic economy manifested by mothers in that class. That Dr. Strange is right in ascribing a certain amount of infantile mortality to that igno-

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\* Out of every 100 couples married in Lancashire, 38 men and 67 women were unable to sign their names.—Fifth Report of the Registrar-General. 8vo. ed. p. 8.

rance we have the confirmatory evidence of Mr. Robertson of Manchester, whose testimony on this point is particularly valuable, as he possesses much experience in the treatment of the diseases of children :—

“ In a community so largely, nay, in certain of the more populous townships, almost exclusively composed of manufacturing labourers, where too often a mother is tempted, or by necessity compelled, to follow some occupation away from her own home, in addition to the care of her children ; and where, whether she have such additional occupation or not, she is obliged to do everything for her family single-handed, it cannot but happen that the children will suffer neglect in respect to feeding and cleanliness, and especially in sickness. The difference in these particulars between the labouring and the comfortable classes is manifest, constituting a very important cause of greater mortality in the one than in the other. This an instance will serve to illustrate:—amongst those whose children have the benefit of good skilful nursing and comfortable lodging, few die of measles. This is well known : whereas, amongst the ignorant and poor, measles destroy numbers ; and often, when not directly fatal, leave an impaired constitution soon to fall a prey to some other disease. From Table B. it is seen that in Chorlton-upon-Medlock, Hulme, and Ardwick, the deaths from measles alone in the year 1841 were nearly nine per cent. of the total deaths. As also that in most of the other townships which are inhabited by a similar class of persons, measles proved very destructive ; while in Cheetham with Crumpsall, and Broughton, the deaths from this cause form a comparatively small item in the aggregate mortality. It needs only to cast the eye on Table C. to discover what a heavy amount of infantile mortality is produced by disorders entered in the public registers—as teething, hydrocephalus, wasting, bowel complaint, convulsions, and the like ; maladies, whose primary seat being, in general, the stomach and bowels, may often justly be put to the account of injudicious feeding and unskilful nursing in sickness. And though it be, doubtless, true that infants die of ailments of this nature under the most favourable circumstances, a heavy amount of mortality remains to be attributed to the errors and defects now mentioned, and which rarely occur in the families of the educated and the affluent.”

100. It thus appears positive that a certain amount of the enormous infantile mortality for which Lancashire has such an unenviable pre-eminence, is due to moral, as well as to those direct physical causes which I have already shown as in a marked degree increasing this mortality. But whilst I fully concur in the above observations, I am not satisfied with the general allegation, that the excess of deaths is due to the poverty so often experienced in the manufacturing districts. Poverty can certainly never be a cause of increased health, and, in fact, when it does exist, must favour the production of disease. But the allegation to which I allude is of mischievous tendency, by conveying the impression, that the causes of excessive mortality are beyond control. I have already stated, that in the low-waged county of Wilts only 11 per cent. of all the children born are swept off before they attain one year of age ; while 17 per cent. are removed by death in Lancashire ; and Mr. Robertson adduces similar facts by a comparison of the infantile mortality of the latter county with Dorsetshire. The pauperism in the agricultural counties is also considerably greater than in Lancashire, the paupers in the latter county being 1 in 11 of the inhabitants ; in the former counties referred to, 1 in 8.\* Mr. Farr

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\* App. E. to Eighth Annual Report of Poor Law Commissioners.



coincides in the opinion that pauperism is not the cause of the excessive mortality found in our cities, for in his first letter to the Registrar-General, he says—

“ The occupations in cities are not more laborious than agriculture, and the great mass of the town population have constant exercise and employment ; their wages are higher, their dwellings as good, their clothing as warm, and their food certainly as substantial as that of the agricultural labourer. The Poor Law Inquiry, and successive Parliamentary Committees, have shown that the families of agricultural labourers subsist upon a minimum of animal food, and an inadequate supply of bread and potatoes. The source of the higher mortality in cities is, therefore, in the insalubrity of the atmosphere.”

The returns presented to the Manchester Statistical Society, in 1836, and quoted by Mr. Chadwick in his Sanatory Report, (p. 182,) show that the “ consumption exclusively amongst this population (the factory class) could not be less than 105 lbs. each person annually, man, woman, and child ; or 450 lbs. yearly *per family* of butchers’ meat alone, exclusively of bacon, pork, fish, and poultry.” The question, as to the influence of poverty on the public health of a district might receive an easy solution by comparing the rate of mortality in prosperous years with that of distressed years. Unfortunately, however, the poor-rates, which we would naturally adopt as the index of distress or of prosperity in a district, indicate at present little else than the efficiency of management of these rates. If we take a district in which out-door relief prevails, and where the management is on the whole unexceptionable, such as Manchester, it will be seen that there is little connexion between excessive mortality and distress or pauperism—elements, indeed, very distinct. (See Chart, next page.)

If any connexion between pauperism and mortality be exhibited by this chart, it is that the years possessing the *largest* amount of pauperism have actually the *least* mortality ; but I think it better, in the present state of our knowledge, to view it as a negative result, showing rather the absence of connexion between pauperism and excessive mortality than any proximate relation between pauperism and diminished mortality. I do not, therefore, assert this chart as indicative of a substantive law, and for this reason, that even in Manchester, selected as a favourable example of the administration of the poor-rates, there may have been some relaxation in affording out-door relief of which I am ignorant ; and this might account for the great fluctuations in the line of pauperism. However, there was ample evidence in the late distress that the excessive mortality of this country is not due to pauperism. The manufacturing towns of Paisley and Glasgow had a reduction in their average mortality, and this was also apparent in the manufacturing towns of this county. Thus in Manchester, Salford, and Stockport, there were 11,323 deaths in 1838 ; and in 1842, a year of great outcry and distress, there were only 10,201 deaths, being a decrease of 1122, notwithstanding the crowding together of several families into the same tenement, which was shown to have decreased the number of occupied houses. Dr. Arnott, Mr. Chadwick, and others, are of opinion that the experience of the late distress indicates some direct connexion between the poverty of the country and its diminished rate of mortality.





If it be true that there is a diminution of mortality in years of distress, it must be greatly, if not entirely, owing to the reduction in those cases of deaths which result from the indulgence of vicious and costly propensities, such as the exhibition of narcotics to infants, and the intemperance of adults. As poverty in itself cannot be a cause of health, we must presume that the repression of such propensities would in years of prosperity cause a great diminution of mortality.

This is not a question of the effect of cheap and dear provisions on the health of the community,—it is whether or not causes of disease exist in prosperous times, the removal of which causes produces such diminution in the number of deaths, that the excess arising from poverty becomes more than counterbalanced. In other countries, where intemperance among adults and children is not so prevalent, the statistics of mortality in years of distress and prosperity will, in all probability, show the effect due to poverty.

A committee of operatives of Ashton-under-Lyne constructed the following table, with the assistance of Mr. Coulthart, one of the principal bankers in that town; and, according to their own confession, 14,000*l.* are annually expended by the operatives in the consumption of ale and spirits, and only 2,000*l.*, or one-seventh the amount, in the education of their children.

TABLE showing the average ANNUAL AMOUNTS expended by the COTTON OPERATIVES of ASHTON-UNDER-LYNE, in FOOD, CLOTHING, FUEL, HOUSE-RENT, and sundry small items of Domestic Consumption; also the Sums paid Annually by the same Persons for EDUCATION, ALE and SPIRITS, MEDICINE and MEDICAL ADVICE; together also with a Statement of the Aggregate Annual Amount deposited in the Savings' Bank:—

Food.	Clothing.	Fuel.	House Rent.	Sundries	Educ- tion.	Ale and Spirits.	Medicine and Medical Advice.	Savings' Banks.	Total.
£. 185,720	£. 26,410	£. 9,350	£. 33,870	£. 8,180	£. 2,220	£. 14,430	£. 6,160	£. 2,410	£. 288,750

To the above expenditure should be added the sums wasted in the purchase of narcotics, for infants. In years of distress many mothers, unable to obtain work at the factories, remain at home, giving an unusual personal care to their children; and without either the ability or inclination to purchase narcotics for them. This circumstance, and the compulsory sobriety of adults, will, as already intimated, sufficiently account for the diminished mortality of such periods.

101. I believe there can be little doubt of the accuracy of my statement, that the prevalent custom of exhibiting narcotics to children arose from the depressed state of their constitution, caused by the existing physical causes of irritation and disease. And all concurrent evidence combines to show, that the same conclusion may be drawn with reference to the intemperate habits of adults. The low state of the system produced by continued exposure to the physical causes of disease creates an appetite for stimulants, which gradually lowers the moral as well as the physical condition of those who resort to their use. The absence of cleanliness in houses produces a state of discomfort at home, which gradually drives the most well-disposed person to the

tavern, and causes much crime and immorality. I have forwarded to you a sanatory and criminal map of Preston, in which you will see, that where the physical causes of diseases most abound, there crime also prevails to the greatest extent. The Inspectors of Prisons in Scotland, from separate inquiries, have also come to the conclusion, that the physical causes of disease indirectly become the causes of crime.

The tendency to crime becomes increased by the comparatively few old and experienced men left to counteract the haste and inexperience of youth. In the recent riots in Lancashire, the great majority of the rioters were found to consist of persons just emerging from boyhood, the absence of elderly persons among them was a matter of common remark. Mr. Combe has remarked, that the comparative paucity of aged and cautious persons is the cause of the inconsiderate and turbulent movements in America. The obstacles to the spread of education are also connected with other causes. Let us remember the astounding results obtained by the Rev. Mr. Clay, in his inquiries into the state of crime in the northern division of Lancashire, and exhibited in the following table, which refers to the prisoners admitted to the house of correction at Preston, during the year 1844:—\*

TABLE intended to show the DEGREE of IGNORANCE in PRISONERS on the most ordinary Subjects, as compared to their direct or indirect acquaintance with demoralizing Literature, the centesimal proportion calculated on the whole Number of each Class (Sessions and Summary).

DEGREES OF IGNORANCE, &c.	SESSIONS.			SUMMARY.		
	M.	F.	Per cent. on 416.	M.	F.	Per cent. on 1022.
Unable to name the months of the year, &c.	163	45	50	416	85	49
Ignorant of the name of the reigning sovereign.	134	34	40	344	62	39
Ignorant of the words "virtue," "vice," "righteousness," &c.	143	36	43	355	75	42
Unable to count a hundred . . . . .	65	18	20	112	24	13
Have read, or heard read, books about Jack Sheppard and Dick Turpin.	158	18	42	314	39	34

\* As explanatory to the Table, Mr. Clay remarks, that "Conceiving that no person could attend a place of worship, however seldom, without learning there, if from no other source, the meaning of such words as 'righteousness,' 'virtue,' 'vice,' &c. I selected them as affording tests of such attendance, and of the possession of even the lowest degree of knowledge: the Table No. 30 shows the result of my inquiry, viz., that more than 42 per cent. of all the prisoners committed during the year were entirely ignorant of the sense of the words. The greater number were content to admit their ignorance; some, however, guessed at their meaning; and with regard to 'righteousness,' said that it meant 'badness,' 'bad company,' 'a bad mind,' 'doing wrong,' 'swearing,' 'fighting and being drunk,' 'that they should not be so rich,' &c. &c. &c. Among the opinions as to her Majesty's name, seventeen were in favour of 'Prince Albert,' and thirteen supposed it to be 'Elizabeth.' But enough has been now stated to manifest the extraordinary and general ignorance on useful and important matters, and the equally general acquaintance with literature—if the name be not prostituted in thus applying it—of the most exciting and demoralizing character."



During the collection of the facts necessary to obtain this information, I had various opportunities of observing the anxious care and fidelity with which Mr. Clay has recorded them. From all I have seen during my investigations, I am too well assured that this melancholy amount of ignorance and crime is essentially connected with the exposure to bodily disease.

We see from this table that about 40 per cent. of the prisoners are unacquainted with the name of the reigning sovereign, and consequently can have little conception of law and order; their religious knowledge is still more deplorable, as instanced in the following table, which shows that 40 per cent. of the prisoners are unacquainted with the Saviour's name :—

TABLE.—RELIGIOUS KNOWLEDGE OF PRISONERS.

DEGREES OF KNOWLEDGE.	SESSIONS.			SUMMARY.		
	M.	F.	Per cent.	M.	F.	Per cent.
Ignorant of the Saviour's name, and unable to repeat the Lord's Prayer.	134	36	41	329	71	39
Knowing the Saviour's name, and able to repeat the Lord's Prayer more or less imperfectly.	165	34	48	454	68	51
Acquainted with the simple outlines of our Lord's history.	37	9	11	95	7	10
Possessing that general knowledge of religion level to the capabilities of the poor and unlettered.	1	0	..	1	0	..
Familiar with the Scriptures, and well instructed in doctrine.	..	..	..	..	..	..
	337	79		879	146	

The following table shows that drunkenness and the indulgence of unlicensed passions, and not distress, are the causes of crime :—

Predominant in Character or Condition.

	SESSIONS.		SUMMARY.	
	M.	F.	M.	F.
1. Profligacy . . .	202	50	422	93
2. Ignorance . . .	90	16	265	30
3. Distress . . .	10	7	96	17
4. Comparative respectability	35	6	96	6
	337	79	879	146

In talking of the population of this county, however, it is important to avoid a prevalent misrepresentation, and to consider, in respect to its town population, that very often the greater proportion of it is a collection from all parts of the United Kingdom, of persons who are loose, unattached, ready to migrate, and undertake any work for which high wages are offered. Out of every 10,000 of the population of Lancashire, it appears, by the Census Return, that no less than 1220

are born in other counties in England, 635 are born in Ireland, and 130 in Scotland. When it is considered that the largest proportion of these are adults, and that the bulk of them are found in the towns, it will be seen how erroneous may be the conclusion drawn in respect to the native county population.

All the experience acquired during this inquiry points out that one immediate effect of the operation of morbid causes, even when not present in sufficient intensity to produce direct disease, is to create an appetite for vicious indulgences. It is too common a mistake to transpose the effect for the cause, and to ascribe the disease to the indulgence of those propensities which in the first place were created by the low sanitary state of the district.

101. It is in districts of a bad sanitary condition,—a term generally synonymous with a low moral state,—that we observed those appalling facts which lead to the conclusion, that infanticides, either by wilful neglect or by direct intention, are perpetrated in order to procure the burial-money paid on the death of the child. The inducement to this exists in the large sums paid on death, which by an analysis of the returns of 232 burial-clubs, I found, on the average, to be 8*l.* 12*s.*, while the cost of a child's interment rarely amounts to more than 2*l.* The benefit from the demise of a child is so great, that an expected death is often brought forward as a plea for delay in the collection of rates. Mr. Sumners, a collector for the Preston Water Company, is asked:—

“Have you frequent excuses given for the non-payment of the water-rents?”

“Now and then; for instance, yesterday, a woman asked for delay, and I have had several times the same reason given to me when delay was wanted.

“To what reason do you allude?”

“Mothers say, we cannot pay you just now, but we soon hope to do so, for we expect the burial money for a child who is very sick.”

Mr. Smith, a large cottage owner in Preston, states, “that I have often had the same excuse given to my collector; the parents have said to me, only wait a little and we will pay the rent: we have a child sick.” When Mr. Clay was reporting to me on the state of burial clubs, a lady incidentally said to him, “I have a young woman engaged as a wet nurse, and hearing that her own child was ill, I offered to send my own medical man to attend it, but she answered, ‘Oh! never mind, ma’am, it’s in two burial clubs!’”<sup>\*</sup> It is not an unfrequent circumstance to find a child enrolled in three or more burial clubs, so that the parents may receive at its death from 16*l.* to 20*l.* That, in certain instances, this has been productive of infanticide is proved beyond all doubt by the well-known trials for infanticide at Bolton and Stockport. The collectors of burial clubs have themselves observed

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<sup>\*</sup> As another instance of the advantages looked forward to at death, I may cite the following case which happened only a few weeks since at Preston gaol. J. W., the son of respectable parents, has, as the result of his dissipated habits, received sentence of transportation. His father writes him a letter containing expressions of deep regret and much religious advice as to his future conduct. He reminds him, however, in a postscript, that all along his parents had paid his subscription to a burial club, “so if anything *transpires* in your passage out, or when you arrive, take some means of letting us know.”



cases which led them to suspect intention of infanticide. One collector to a society of 5000 members, states that—

“ He is acquainted with cases in which *hired nurses* have speculated on the lives of infants committed to their care, by entering them into the clubs. Within the last few days, two young women proposed to him to enter a child into the society in which he holds office, offering to pay the weekly premium alternately. Upon inquiry, in conformity with his usual custom, as to the relation subsisting between them and the child, he learned that the child’s mother was dead; and that *the infant itself was placed at nurse with the mother of one of these young women.* He also detailed the particulars of the case of an illegitimate child, which, having been in the care of its maternal grandmother, was removed, on her death, to the house of its father’s relatives. Within a week of that removal, the child died (although previously it appeared to be in strong health), and under such circumstances as induced him not only to refuse payment of the burial money from his club, but also to make such a representation of the affair to the officers of another club in which the child had been insured as led them to make a similar refusal. No attempt was made to compel payment from either society.”

However, the officers of burial-clubs have generally not observed the evils arising from the system under which they are at present conducted. The first inquiries as to the injurious tendency of the system were met with disbelief as to the existence of such tendency, but perseverance in the investigations, by parties only interested in the discovery of the truth, led to the development of evils of which these officers had no previous conception.

Besides the special cases observed, an analysis of returns from Preston, where, in three societies alone there are upwards of 23,000 members, has distinctly shown that there is a greater rate of mortality among children entered in burial-clubs than in those not belonging to them. Mr. Clay says:—

“ Assuming, as we may, that the deaths in the society ‘not payable’ appertain almost solely to children dying before ‘16 clear payments have been made for them,’—i. e. to children between two and six months old, a comparison, as regards this class of children between the town and the society may be thus given:—

“ Annual average of deaths in the town (excluding those under 2 months and above 67 years) 1193:—deaths between 2 and 6 months, 125 = 10·4 per cent. on all the *deaths*.

“ Deaths in the club for 1843, 501; deaths between 2 and 6 months, 32 = 6·4 per cent.

“ A difference of this kind, though not perhaps to this extent, might be expected. The children entered into the society are, in a great measure, select lives; and, during the 16 weeks, they are sure to receive as much attention as can be bestowed upon them; while, on the contrary, the uninsured children will include all the weekly and precarious lives rejected by the societies.

“ The total of infant deaths in the society is, according to the table, 8 per cent. on all the children entered.

“ The deaths in the general population of the same class of children (between two months and five years) have been, on the average of the last six years, 629 annually. The census of 1841 stated the children under five to 6885: and if we take from that number 300 as the proportion under two months old—a deduction greater, probably, than the facts would require—

we have a mortality (629 deaths in 6585 children) of 9·6 per cent. Having seen that infants dying in the town between two and six months are 10·4 per cent. in all the infant deaths, while the same deaths in the society are only 6·4 per cent., we should be led to expect that a similar proportion would appear when infant deaths from two months to five years in the town are compared with those of the society; the non-insured comprising the poorest and sickliest, and the insured being more choice lives, and that the facts would probably be represented thus:—

Mortality between Two and Six Months, calculated on Infant Death.		Mortality between Two Months and Five Years, calculated on Infant Population.	
Town.	Society.	Town.	Society.
As 10·4	: 6·4	: 9·6	: 5·9

“ But the mortality of the society, instead of appearing as above, 5·9 per cent. is 8· per cent.

“ The members of this burial society forming so large a portion of the whole population, it may be desirable to separate them from the general mass, and compare the mortality of the two parts respectively for the year 1843, estimating the population at 52,500, and taking the mortality from the table No. 4:—

Members of burial society .	16,350	Deaths .	501 = 3 per cent.
Remaining population .	36,150	„	996 = 2·75 per cent.
	<u>52,500</u>		<u>1,497”</u>

102. Before concluding, I would remark that all the facts elicited during the inquiry tend to show that excessive mortality is due to adventitious causes, in almost every instance removable by the combined action of physical improvements, and by the extension of education. Humanity calls loudly for the interference of a paternal legislature to remedy the evils widely spread and deeply rooted—but not irremovable. Sound political economy cannot be in any way opposed to true humanity; and I would say, that all the principles which conduce to the good order and prosperity of the state are involved in the improvement of the sanatory condition of the population. I have endeavoured to show that the present removable causes of evil produce, in addition to excessive disease and death, the physical and moral deterioration of the survivors; that while they occasion an immense infantile mortality, they do, at the same time, cause every year a destruction of adult life unparalleled in the annual loss sustained in the most cruel war of modern times; that, while they are productive of a mortality so great, they do not retard, but, on the contrary, rather favour the increase of population by inducing early marriages; and, lastly, that they entail immense pecuniary burdens on the community, for the support of the war of removable disease against an unprotected population. The great mistake in all the labours of charitable institutions and of individuals, has been in expending their efforts in amelioration, and not in the endeavour to prevent the necessity for that amelioration, by the removal of the causes of disease.

I find that in this county there are, according to the census, 76 physicians and 1246 surgeons and apothecaries. To make up prescriptions there are no less than 1259 chemists and druggists. Here, then, we have a body of 2581 men, connected with the medical pro-



fession ; and supposing that each practitioner, on an average, receives 300*l.* per annum, we have a sum of 774,000*l.* per annum devoted exclusively to the business of the cure or alleviation of disease, and not one single professional man appointed,—not one public endowment or provision made, to ensure attention to the means of prevention,—nothing devoted to ascertain the causes of death,—nothing done to remove those causes of disease, which are proved to be removable ;—nothing done to warn against defective drainage and to promote external and internal cleansing ;—no visits to ensure the due ventilation of schools or workshops, of mines or houses ;—nothing done to point out the influence of various noxious agencies to the public health,—cesspools, slaughter-houses, grave-yards or offensive and injurious trades ! In short, at least, 5,000,000*l.* per annum are paid (*see* § 92,) to sustain the attacks of preventible disease against the population of this county, and not one pound to remove or weaken the sources from which these attacks gain strength.

103. I have brought before you the injurious influences pressing on the sanatory condition of the population of the county which you intrusted to my examination. It was my duty to refer only to the causes of disease, and, therefore, my Report has been principally a catalogue of evils ; because, until recently, the sanatory condition of towns has not engaged general attention. As soon, however, as the subject has assumed its proper importance, the energy and zeal characteristic of Lancashire, when applied to the prevention, and not merely to the amelioration, of disease, will, I doubt not, elevate the county in the scale of health, and deprive it of the bad pre-eminence which it now holds as the most unhealthy county in England. There is a fearful necessity for improvement ; for, as well observed by Mr. Clay, “a great community is never stationary ; there is always a tendency upwards or downwards, according as the few above or the many below exercise influence ; while, independent of the movement of the general body, there are ever some individuals sinking, and happily more successfully struggling to rise. But the great mass is yet chaotic ; and unless, by God’s blessing, breathed upon by the spirit of intelligence and of religion, it may be hurled upon all that is fair and good among us, with a momentum as sudden as it is irresistible.”

My Lords and Gentlemen, I have the honour to be your obedient and faithful servant,

LYON PLAYFAIR.

*Abbreviation of the Supplemental Part of the Report on Large Towns in Lancashire.\**

The authorities in Liverpool, especially the committee of the town council appointed under the "Health of the Town Act," are of opinion that the excessive mortality of that town is altogether due to its migrant population. The arguments of the Health Committee in support of this view, and the results of my own investigations on the same subject, are published at length in the folio edition of this Report; an abbreviation of this examination is, however, all that is requisite in this curtailed edition.

Much ingenuity has been shown in other towns, as well as in Liverpool, to escape the returns of excessive mortality by throwing the excess upon its migrant population. Of course this unwillingness to believe in the unhealthiness of a particular district does not arise from an intentional wish to pervert facts, but either from confined ideas of vital statistics, or from ignorance of the habits and character of a migrant population. The authorities in Liverpool have been led to conclude that their town is in reality healthy, by conceiving that many of the deaths exhibited in the returns of mortality are due to migrants in their passage through Liverpool. All such deaths must increase the aggregate mortality of the town in which they occur; but it is not from this point of view that we judge of the sanatory condition of a district. The rate of mortality to the population, or the average age of those who die, is the index of the sanatory condition of the town, and the aggregate number of deaths is only useful in supplying data for developing this index. If, then, those who pass through a town are MORE liable to disease and death than those who reside in it, then its excessive mortality ought not to be attributed to the town itself, but to the accidental circumstance of its being the resting place for the diseased and dying; but if, on the other hand, it can be shown that people in the act of migration are LESS liable to disease and death than the inhabitants of the town through which they pass, then the fact of there being a large number of this class gives a fictitious appearance of health to the town by increasing the proportion of the population to the deaths. This must certainly be the result if the census be taken at a season when migration is on an average, so that a fair proportion of migrants may be included in its returns. The last census was taken in June, as we are informed by Dr. Duncan, "during the height of the season of emigration;" and hence the number of migrants must have been above the average.

1. The Health Committee argue that the deaths are increased by persons emigrating to America, some of whom die in their passage through Liverpool, "all of which are put down in the registrar's books against the town." On the experience of 1842-43, 46,426 emigrants passed through Liverpool to the colonies, of whom only *four* died, making the rate of mortality of emigrants in that town 1 in 11,606, while the rate in Liverpool is as great as 1 in 29. This number of emigrants

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\* For the Supplement at large, see Appendix, Second Report, p. 73.



is equal to a standing population of from 450 to 500 on any given day of the year; so that, referring the deaths to this number, the rate of mortality is 1 in 112, or about four times more favourable than that of the town through which they pass. Thus the only effect of emigration must be to increase the proportion of the population to the deaths.

An impression also prevails that deaths frequently take place among immigrants, arriving, as they occasionally do, in a state of disease, acquired by privations abroad. But this impression is vague and unsupported by statistics; for the governor of the workhouse, to which place it is asserted that these immigrants go in a state of destitution and die, states, "That, according to our records, no such persons have been admitted during the last three years."

2. The Health Committee refer to the large influx of Irish during harvest, conceiving that they serve to increase the apparent unhealthiness of Liverpool, by falling victims to fevers in their passage through the town. Admitting this to be the case, the town is accountable for these deaths, produced by a preventible disease; but there is no evidence of deaths occurring to any material extent in this class. The inspectors of police who wait on the disembarkation of the steamers from Ireland, describe the Irish emigrants as a healthy class, unaccompanied, with few exceptions, either by wives or children. The proportion of adults to children arriving by steamers from Ireland is 50 : 1; so that the deaths occurring in Liverpool of any of this class must tend to give a fictitious appearance of longevity in the town by increasing the average age at death.

3. In connexion with the Irish casual residents, a table is given by the Health Committee, in which it is shown that 6000 or 7000 paupers are annually passed to Ireland through Liverpool. The number of paupers dying annually in their transit through Liverpool is 5, according to the evidence of Mr. Evans, the pass-master. The standing addition to the population caused by these paupers is about 150; so that the rate of mortality is 1 in 30, a proportion more favourable than that of Liverpool. The average age of the paupers dying is 34 years, while the average age of death in Liverpool is only 20 years; so that besides diminishing the rate of mortality in the town, the deaths of paupers must aid in increasing its fictitious longevity.

4. Mr. Grey, the assistant overseer, in his examination before the Health Committee, attributes much of the excess of deaths to the circumstance that many Irish come over to Liverpool on purpose to be delivered. This is altogether a mistake, for the rules of the Lying-in Institution in Liverpool preclude the extension of their charity to strangers, and few will credit that persons will leave Ireland for the miserable comfort which a workhouse affords. But the point in the argument is not easily perceived, for births do not contribute to swell the pages of the registries of deaths, except in so far as children are more liable to disease. Mr. Grey, in his evidence, ascribes many deaths to the increase of illegitimacy since the passing of the New Poor Law, stating that the mortality is considerably greater among illegitimate than among legitimate children. If this were true, as ascertained by his parish experience, it must be indicated by an increase in the numbers of coffins supplied to children; but it will be observed, by the

following table, that there is a decided decrease instead of increase in this department :—

COFFINS supplied to CHILDREN from the LIVERPOOL WORKHOUSE.

	—	1840	1841	1842
	Out-door . . . .	1,017	900	842
	In-door . . . .	195	145	140
	Total . .	1,212	1,045	982

5. The Health Committee refer to the sailors resorting to Liverpool, whose numbers they estimate at 110,000. From data which are stated at length in the folio edition, I estimate the standing addition to the population caused by seamen and their families at 15,767, and their mortality at 523, or a proportion somewhat more favourable than 1 in 30. The average age of death of the mariners is  $22\frac{2}{3}$  years, or more than one-third higher than that of the labouring population of Liverpool. In both points of view, therefore, the mortality of mariners serves to enhance, but cannot decrease, the apparent healthiness of the town.

6. The same result follows an examination of the other migrants in Liverpool, for, in almost every instance, they form an adult population, and their deaths serve to increase the apparent age at death of Liverpool. In spite of all this adult population, we find the age at death in Liverpool to be extremely low, viz., 20 years. The average age of mendicants is 31 years; so that their deaths may serve to enhance, but cannot diminish, the average age of the town. Returns from the railway companies show that the proportion of adults to children travelling is as 78 : 1 in the long railways, and 33 : 1 on the shorter lines; and the officers connected with railways state that parties in a state of sickness are rarely observed to travel. This was naturally to be expected, and accounts for the few deaths occurring amongst a migrant adult population. Dr. Duncan found that  $94\frac{1}{2}$  per cent. of all the persons applying to the dispensary for relief were either natives of the town itself, or had resided in it more than a year, and that only 1·12 per cent. of the applicants had been less than a month in the town. It has been remarked by the Rev. Mr. Clay, in his report on Preston, that the cause of the small proportion of deaths to the number of prisoners in gaols is owing to many of their inmates being “vagrants with constitutions braced by fresh air”—a just conclusion, but in direct opposition to the deductions of the Health Committee of the Liverpool corporation.

7. In conclusion, in the folio edition I examine at length the opinion of the Health Committee, who ascribe the excessive mortality of recent years to the influx of a starving population from the manufacturing towns, and show that they have been led into error by adopting only one half year on which to ground their conclusions. Referring to the examination *in extenso* for further proofs in support of the conclusions



to which I have arrived from the previous inquiries, I now sum up those conclusions as follows: that—

The migratory population of Liverpool is a much more healthy class than the residents of that town.

That the migratory population consists generally of adults.

That the deaths occurring among such a population must give an appearance of longevity to Liverpool, to which it is not entitled.

That the proportion of the population to deaths is elevated by migrants, and that Liverpool is thus rendered apparently more healthy than it really is.

That the opinion of the Health Committee as to a great influx of the starving population of manufacturing towns in the distressed years is erroneous, being based upon the mortality of a half year, which showed a great excess over that of the half year preceding, and of all similar periods since.

I now subjoin the following statistics of the mortality and average age in Liverpool, arranging the deaths according to the classes in which they occur.\* If I have adopted correct conclusions from the inquiries instituted, I feel fully convinced that the public spirit usually displayed in Liverpool will be directed successfully to the elevation of its public health; and in that case the following tables may be of use, as indicating the classes in which the pressure of the preventible causes of disease is most intense. There must be something very wrong in a community, when the artisan reaches only 15 years of age, and has 28 years less chance of life than the gentleman; or when the tradesman reaches only 19 years of age. In the present state of registration, occupations cannot be ascertained with absolute accuracy, as far at least as regards shopkeepers and artisans. A "baker," for example, may either be the head of the establishment or a mere subordinate, as the registration books do not indicate the difference. In all such dubious cases the character of the dwelling, as shown by the class of street, was taken as the most probable proof of the position during life of the person dead. In the class of "gentlemen" no such doubt exists, and therefore running both classes of tradesmen and artisan together, the resulting average age to which they attain, viz., 17 years, is fearfully low when compared with other towns and districts.

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\* For the deaths according to *districts*, see folio edition, p. 81.

TABLE showing the AVERAGE AGES of those who DIED at different Periods of LIFE, and in various CLASSES, of the DISTRICT of LIVERPOOL, 1841 and 1842.

DESIGNATION.	Number of Deaths.	Average Age of all who Die.				Average Age of all who Die under 5 Years.		Average Age of all who Die above 5 Years.		Average Age of all who Die above 21 Years.		Per Centage of Deaths under 5 Years to Total Deaths.	Per Centage of Deaths above 5 Years to Total Deaths.
		Yrs.	W.	M.	D.	Y.	M.	Y.	M.	Y.	M.		
Gentry & Pro- fessional Men	268	43	0	0	0	1	0	53	8	58	10	27	73
Shopkeepers .	3,728	19	0	4	0	1	3	42	0	48	10	54	46
Artizans . .	7,743	15	10	0	5	1	4	40	0	47	6	51	49
Mariners . .	1,046	22	3	2	5	1	2	43	8	48	7	48	52
Undescribed .	646	25	0	2	3	0	11	40	10	44	3	35	65
Workhouse .	1,068	40	8	0	3	0	10	46	11	52	0	14	86
Infirmary . .	319	36	4	1	2	3	2	36	5	39	4	1	99
Total Average	14,818	20	2	0	6	1	3	41	10	48	3	52	48

Note.—In this Return there are 86 deaths less than those given by the Registrar-General for 1841, and 59 deaths less than those given for 1842. The cause of the error could not be traced without very much labour; but in the aggregate number of nearly 15,000 deaths cannot affect the average age of death above a few days at the most.

TABLE showing the PROPORTION of MIGRANT POPULATION in various DISTRICTS in the COUNTY of LANCASTER.

HUNDRED, &c.	Proportion of Foreign Population to Total Population.	Total Number of Foreign Population.				
		Born in England.	Irish.	Scotch.	Elsewhere.	Total.
b Amounderness Hundred.	1 in 11	4,808	2,218	568	629	8,323
b Blackburn Hundred . .	1 in 14	10,302	1,559	1,161	1,123	14,145
Leyland Hundred . .	1 in 23	1,286	611	157	318	2,372
a Lonsdale, North, Hundred	1 in 6	3,797	114	105	164	4,180
Lonsdale, South, Hundred	1 in 7	2,751	105	59	164	3,079
Salford Hundred . .	1 in 8	44,589	9,549	2,277	2,168	58,583
West Derby Hundred . .	1 in 10	10,682	5,559	1,188	1,311	18,740
Lancaster Borough . .	1 in 6	1,989	173	133	33	2,328
Liverpool Borough . .	1 in 2	64,192	49,639	11,088	3,820	128,739
Manchester Borough . .	1 in 3	48,252	30,304	4,113	2,383	85,052
Salford Town . .	1 in 4	10,170	3,996	583	254	15,003
Wigan Borough . .	1 in 8	690	1 989	315	102	3,096
Totals . .	1 in 5	203,508	105,916	21,747	12,469	343,640

(a) Ulverstone (b) Fylde, &c.



## OBSERVATIONS

ON

*A Table obtained since the completion of the Report on the Sanatory Condition of the Chief Towns in Lancashire.*

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THE case of the population of the large urban district, forming one town, comprising the township and municipal borough of Manchester—the township and municipal borough of Salford—may be adduced to illustrate the great economy and the interest of all classes (and most of the labouring classes) in securing by a general and compulsory rate for the payment on a contract in their behalf, on the lowest terms, of a general, abundant, and constant supply of water at high pressure. The case will show the heavy additional tax imposed on the labouring classes by the old, or what is called the voluntary, system of supply of this first necessary of life.

For the supply of 66,000 dwelling-houses, and about 2800 warehouses, factories, and other tenements, on a plan adopted by the old water company, and agreed to by many of the influential inhabitants, of the constant supply of water, for all purposes, domestic, trading, and public, night and day, at high pressure, an income of 40,000*l.* per annum is stated to be requisite. The expenses of management are estimated at 8000*l.*, the repairs 2429*l.*, and 10,000*l.* per annum is required to pay interest on a new loan of 250,000*l.*, and the rest to pay the dividends of the existing shareholders of a capital of the estimated value of 350,000*l.* previously invested.

On this plan, which proposes that the expense shall be levied by a general rate, the old company, instead of having indefinite proprietary rights, would be lessees or contractors for the works, and managers for an annual income, to pay the interest on capital and the expenses of management, this annual 40,000*l.* per annum, it is proposed, shall be raised by a rate of  $1\frac{1}{4}$  per cent. on the rental of manufactories,  $2\frac{1}{2}$  per cent. on warehouses, and  $5\frac{1}{2}$  per cent. on the rental of the 66,000 dwellings.

To illustrate the principle in question of the economy of an universal rate for an immediate and general supply, it may be assumed that the whole of the new plan and every part of the works and the purity of the water is complete and unexceptionable, that the annual remuneration to the company for management, *plus* the interest on capital, is fair, and the distribution of the charge and the rating of the factories and warehouses equitable; and, in short, that the gross sum 28,636*l.* required from 66,734 dwelling-houses, or 8*s.* 7*d.* per annum, or 2*d.* per week per house, one with another, for a constant supply of pure water, night and day, is just and necessary.

The following table, for the data of which I am indebted to the zeal of Mr. Oxley, shows the number of tenements of each chief class, and the amounts which the occupiers would have to contribute, if all were rated, at once to the works, and the burthens which must be thrown upon the rest, if any one class were to be omitted.

## DWELLING-HOUSES OF THE UNDERMENTIONED ANNUAL VALUE.

Under . . .	£5.	£10.	£20.	£20 to £40.	£40 to £60.	£60. to £100.	£100. to £900.	Totals.
Number of dwelling houses . . . .	24,367	25,020	10,627	4,289	1,386	687	358	65,734
Amount of rental of each class . . . .	£90,845 2s. 11d.	£169,307 1s. 11d.	£139,291 2s. 4d.	£119,687 12s. 5d.	£66,531 8s. 10d.	£51,856 3s. 0d.	£53,971 9s. 6d.	£691,490 0s. 11d.
Water rents, about $4\frac{1}{8}$ per cent. on rental .	£260,152 4s. 10d.		4,597 9s. 0d.	5,501 5s. 0d.	2,979 10s. 0d.	2,019 5s. 0d.	1,784 15s. 0d.	28,636 2s. 0d.
Or, each house, yearly rents . . . .	£4,873 8s. 0d.	£6,880 10s. 0d.	0s. 8d. 7 $\frac{1}{2}$	1s. 5s. 8d.	2s. 3s. 0d.	2s. 18s. 9 $\frac{1}{2}$ d.	4s. 19s. 8 $\frac{1}{2}$ d.	0s. 8s. 7d.
„ „ weekly rents . . . .	1d.	1 $\frac{1}{2}$ d.	0s. 0d. 2	0s. 0d. 6	0s. 0d. 10	0s. 1s. 1 $\frac{1}{2}$ d.	0s. 1s. 11d.	0s. 0d. 2
Proportion per cent. of each class of tenements to the whole number . . . .	36 $\frac{1}{2}$	74	16	6 $\frac{1}{2}$	2	1	$\frac{1}{2}$	[ .
Proportion per cent. of the pecuniary contribution of each class to the whole	17	41	16	19 $\frac{1}{2}$	10 $\frac{1}{2}$	7	6 $\frac{1}{2}$	. .
Amount of money to defray the outlay which must be levied upon the middle and higher class of tenements so long as those under 10s. per annum are not rated or do not contribute:—								
Total amount of extra rates . . . .	£8,393 0s. 0d.		£8,393 0s. 0d.	£8,763 0s. 0d.	£4,803 0s. 0d.	£3,432 0s. 0d.	£3,255 0s. 0d.	£28,636 0s. 0d.
Extra rate per house, yearly . . . .	0s. 15s. 9 $\frac{1}{2}$ d.		0s. 15s. 9 $\frac{1}{2}$ d.	2s. 0s. 10d.	3s. 9s. 4d.	5s. 0s. 0d.	9s. 5s. 0d.	1s. 13s. 0d.
„ „ weekly . . . .	0s. 0d. 3 $\frac{1}{2}$ d.		0s. 0d. 3 $\frac{1}{2}$ d.	0s. 0d. 9 $\frac{1}{2}$ d.	0s. 1s. 4d.	0s. 1s. 11d.	0s. 3s. 7d.	0s. 0d. 7 $\frac{1}{2}$ d.
Remaining share assessed on factories, &c., (viz. warehouses and trading offices for domestic uses only, 166,659 $\frac{1}{2}$ l., at about 2 $\frac{1}{2}$ per cent.; factories, &c., for domestic purposes only, 72,181 $\frac{1}{2}$ l. 15s. 1d., at 1 $\frac{1}{2}$ per cent.):—								
Total rate . . . . .	£7,040 0s. 0d.		£7,040 0s. 0d.	£7,601 0s. 0d.	£4,147 0s. 0d.	£2,928 0s. 0d.	£2,732 0s. 0d.	£24,448 0s. 0d.
Per house, yearly . . . . .	0s. 13s. 3d.		0s. 13s. 3d.	1s. 15s. 5 $\frac{1}{2}$ d.	3s. 0s. 0d.	4s. 5s. 3d.	7s. 12s. 7 $\frac{1}{2}$ d.	1s. 9s. 2d.
„ „ weekly . . . . .	0s. 0d. 3 $\frac{1}{2}$ d.		0s. 0d. 3 $\frac{1}{2}$ d.	0s. 0d. 8 $\frac{1}{2}$ d.	0s. 1s. 2d.	0s. 1s. 7 $\frac{1}{2}$ d.	0s. 2s. 11 $\frac{1}{2}$ d.	0s. 0d. 6d.



Another instance of the proportions of the lower class of tenements, is afforded by the city of Cork. Out of the whole number of houses there were in 1841 of

4th class, or mud cabins, having only 1 room . . . . .	156
3rd class, or mud cottages, of 2 to 4 rooms and windows . . . . .	1834
2nd class, or houses in small streets, having 5 to 9 rooms and } windows . . . . . }	4950
1st class, or houses of a better description than the foregoing . . . . .	1833
Total . . . . .	8773

Proportion per cent. of Houses of  
each Class, to the whole number.

4th class . . . . .	1 $\frac{3}{4}$
3rd class . . . . .	21
2nd class . . . . .	56 $\frac{1}{4}$
1st class . . . . .	21

The number of Parliamentary electors in respect of 10% house-  
holds, in the city of Cork, in January, 1842, as by return of } 3086  
Parliament . . . . . }

The proportion per cent. of houses under the value of 10% to } 65  
the whole number of houses, was therefore . . . . . }

From the above instances a judgment may be formed of the amount of burthen cast upon all the other classes, by the omission to rate so important a mass of buildings as those occupied by the working classes, and how impossible it would be to exempt them, on the grounds of charity.

On the proposed rate of remuneration for management and risks of failure of 1 $\frac{1}{2}$  per cent., or 2 per cent. beyond the ordinary market rate of interest for such loans—a rate of remuneration which is generally admitted to be at present the lowest, and would scarcely be safe or liberal to reduce, or allow to be reduced by wasteful competition—the whole of the charge must be at once distributed over the whole body of consumers. Every diminution of the numbers contributing, or delay to accept the arrangement, must be at the expense of the rest, on whom the expense must at once fall, unless it fall upon the capitalists. It will be perceived from the examination of the table, with relation to the proportions of the several classes of houses at Manchester and Salford, that if the class of tenements under 10% be not at once rated, all the middle and higher class of tenements must at once be taxed to the amount of 11,573%, or upwards of 4s. per house. In other words, by the exemption of 74 per cent. in number of the smaller tenements (those under 10%), the other classes must be taxed with 41 per cent. of additional outlay, because the owners of this lower class of houses, where the necessity for improved supplies is the greatest, refuse to have their existing charges *reduced* by a general arrangement for the advantage of the occupiers, and ultimately for their own benefit. In the case of Manchester it is literally so, and it will generally be found to be so in most other cases. A large proportion of the houses occupied by the labouring classes in Manchester are supplied with water from wells sunk in back-yards; which wells are always not far from a cesspool,

and commonly are each surrounded by several cesspools. As the neighbourhoods become more dense, and as the population increases, the pollutions of these wells increase. The poor pay now at the least 1*d.* per week, to 1*s.* per month, or 3*d.* per week for the liberty to draw water, hard and polluted from these sources. They are besides taxed with the cost of more expensive labour of pumping and fetching and carrying the water, in wet or in cold, to their houses, and are consequently sparing of the use of the water, even where it happens to be fitted for use. Under the arrangement proposed, in no instance for more money than they now pay directly, and always for much less than they pay indirectly, pure water may be secured to them, and it may be carried into their houses, and up to the tops of the highest rooms, at a rate of less than three farthings for a ton, or for 108 pails full, at two gallons the pail, supplied as they may wish it.

But the owners of the poorest tenements, who in this town, as in most others, are frequently labouring men, are not themselves above the occupiers in intelligence, and rarely consent to any immediate outlays, and it may be presumed will not in this case at once give up their pumps from which they *appear* to derive an additional rent. The expense of the repairs of a common pump seldom cost less than 5*s.* per annum. The common expenses of sinking a well and erecting a pump are stated to be, in Lancaster, 17*l.* The rental and repairs together will seldom be set down at less than from 20*s.* to 30*s.* per annum for each pump. So that when the labour and trouble of collection is taken into account, the owner of this description of property gains little from it, even where there are several occupiers to charge; but where one pump is erected and maintained for each house, there is a mutual loss to the owner as well as the occupier, as compared with the supply of water at the above rates and charges by a company.

Under these circumstances these questions are submitted: Would the Legislature be justified in allowing the middle and higher classes of tenements to be taxed in additional charges, in deference to the blind ignorance which delays improvement, at the parties' own expense, and at the expense of the rest of the community in various ways, and amongst others, in the relief of sickness from the poor's rates, to which this the lowest class of property, commonly escapes contribution? Is it not a paramount duty of the Legislature to act upon its own perception of the evidence demonstrative of the advantage of the proposed arrangement in respect to the public health, and declare that ample supplies of water are "as essential to the population as the possession of a roof to a house, or due space for ventilation," and secure those advantages to the labouring classes by a compulsory rate? When complete assurances and guarantees may be secured under contracts for the attainment of the end proposed, is it either morally or politically justifiable to accede to the ignorance which is proved to be productive of so much filth, sickness, and other evil?

But there are other economical and moral, as well as administrative grounds for supporting a universal and compulsory rate for maintaining a general and constant supply of water, namely, to prevent or to extinguish fires.

The effect of the constant supply of water night and day, at high pressure, will be to diminish (as proved on the experience of towns



where it has been applied,) the actual risk of fire one-half. The insurance charge against fire on 66,000 houses in Manchester, with a rental of 729,780*l.*, would be, on the houses alone, at common risks, 25,200*l.*, and on other property 15,000*l.* per annum, or a gross sum of 40,000*l.* per annum, at the average rate of insurance, which would be 2*s.* per centum, duty 3*s.*; total 5*s.* per centum on the houses; and on stock in trade, machinery, furniture, utensils, at least 6*s.* per centum.

Mr. Corbett, who was for several years a member of the fire committee at Manchester, being asked "if a system of the constant supply of water had been in action there, (meaning the part of the town within the jurisdiction of the municipality,) what amount or proportion of loss from fire do you think might have been saved to the town?" replies, "I think it fair to estimate that one-half of the losses by fire would have been saved. I am not prepared to estimate that saving with very great accuracy, but I feel very confident that it would have been upwards of 100,000*l.* during seven years;" that is to say, 14,000*l.* per annum. On the whole, the prevention of the like amount of loss for the future, in the whole district, would justify a rate for the complete extension of the mains, with fire-plugs, &c., for the constant supply through that whole district, of 20,000*l.* per annum for fire-prevention alone.

The cleansing of the roadway and pavements in the front of 66,000 houses would justify a rate of 4500*l.*, at 1*s.* 6*d.* per house per annum; a very low estimate.

There are as yet no precise data for readily estimating the value of an increased and constant supply of water for the simple purpose of flushing house-drains and sewers and keeping them constantly clean, if such a supply were separable from the domestic supply. An equal sum to that proposed for a supply of water for surface-cleansing would also be a low estimate. So that of the whole annual income required for the complete supply of water to the population, it would be a good economy to levy two-thirds, by an equal rate, for the public purposes alone, if no new supply whatsoever were required for domestic purposes. If, indeed, the town were entirely clear of any old apparatus or demands for compensation, and everything was to be done *de novo*, the whole expense of the new works would be justified by the public purposes last specified—the saving of loss from fire and the service of cleansing the streets, the house-drains, and the sewers.

It has been stated, on competent authority, that a contracting company, in such a case as that of Manchester, with peculiar obstacles to the early voluntary adoption of a supply of water by the smaller owners, and without any guaranteed return, but left to take their chances as to the progressive adoption of the water supply, must justly require a rate of charge from 16*s.* to 20*s.* per annum, in respect of the dividend, and probably 4*s.* or 5*s.* more in respect of the working expenses attending the supply.

A scattered and irregular demand for water, for the lowest and poorest classes of tenements, can only be supplied to them at a proportionately increased expense. The delay of the fair general rating of all classes must therefore be the cause of protracting the evils in question, or it must cause unequal and unfair burthens on one part of the community, and further protract the voluntary and cheerful adoption

of the proved measures of amendment which it is so necessary to promote.

A compulsory rating of the lower class of tenements is, therefore, justifiable for the purpose of extinguishing fires: and for cleansing the streets, drains, and sewers, and the rating is justifiable for these purposes alone considered as measures of police. The completion of the proposed arrangements, and the imposition of undue burthens upon one portion of the community, upon any voluntary system, surely cannot fairly be delayed until the busy have leisure to inform themselves, until the ignorant are educated and made to understand a scientific arrangement, and every one is induced to contribute to it voluntarily! Capitalists can calculate on the intelligence of the middle and higher classes, for the early and voluntary adoption of beneficial arrangements; but they must doubt the progress of conviction and voluntary change amongst the lower classes, and reckon upon much trouble with them, and must therefore require a higher inducement for the risks and delay of any voluntary arrangements.





